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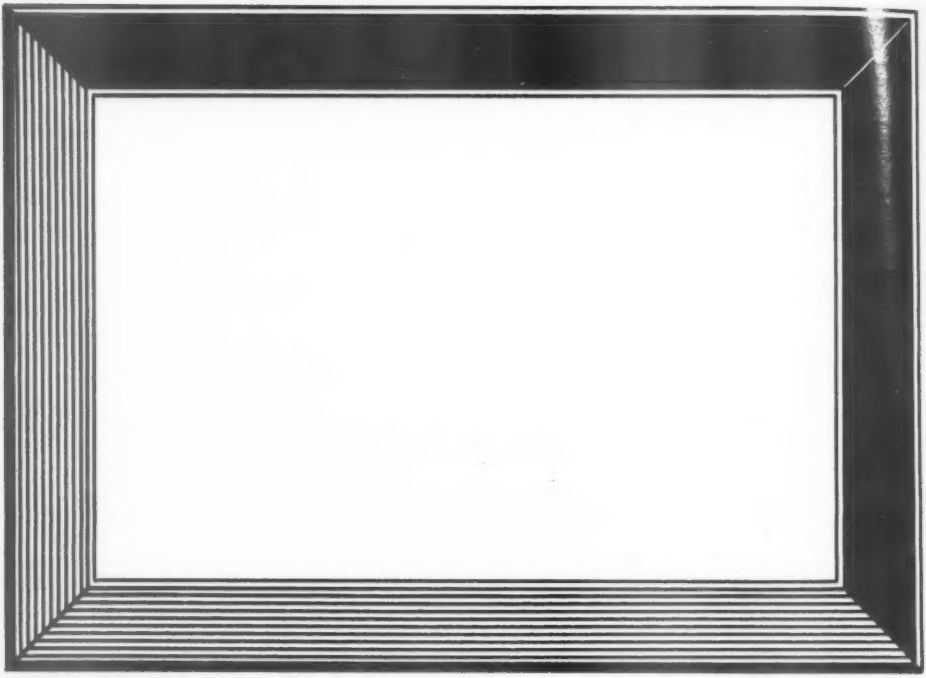

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PRINCIPAL CONTENTS

Technical : PAGE

Plaster Moulding of Beryllium Bronze, by Louis Grand: Applications of the metal and foundry production methods employed for it are discussed, including preparation of the mixture, tempering of the plaster, the pattern, mechanical properties and casting 573

Joint Iron Council Report of work carried out by the Council during the period January, 1956, to June, 1957, in which is incorporated a review of the activities of the Council of Iron-foundry Associations 579

Acoustics Laboratory Details of Keith Blackman's testing facilities installed in North London . 585

Corner Scale in Ingot Moulds . . . 589

Features :

Leader: Ergonomics and Industry: 571
Equipment and Supplies 578
Notes from the Branches 584
New Catalogues and Publications Received 590
Forthcoming Events (Advert section) . 33

Commercial :

British and World Shipbuilding . . 588
Company News 591
Pig-iron and Steel Production . . 594
Raw Material Markets 598
Current Prices of Iron, Steel and Non-ferrous Metals 600

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Ergonomics and Industry

Dr. Floyd in a Paper to the Institution of Mechanical Engineers defined this new word "ergonomics" as the application of anatomical, physiological and psychological knowledge to the study of man and his working environment. Probably the first application would be the decision taken as to the correct height of the workshop bench, yet it is obvious that this is no matter for standardization as what would be considered ideal for one country would be too high or too low for another. For instance, Dr. Floyd cites the case of a design of car based on a survey of 70,000 American recruits, whose average height was 5 ft. 10½ in., whereas the mean figure for men in this country is 5 ft. 8¼ in. Ergonomics, *force majeure*, has a double impact on the foundry industry; first, the organization and arrangement of the plant and its control, in such a way that it needs from the operator a minimum of effort. (The provision of stools for girl coremakers and sprigs and sundries at the moulders' workplaces are examples of what can be done in appropriate cases.) The second needs the endowment of the products of the industry with similar convenience. For instance, the old-fashioned coal-fired kitchen range had the oven at a reasonable level, whereas on many of the modern ones, the housewife has to reach almost to the floor to extract the Sunday joint.

Ergonomics is an important subject for study by foundry executives, but we deem that once this is appreciated, its applications can be accomplished by co-operation between the managers concerned. In considering the relation of ergonomics to foundry products, the designer, the foundry manager and head of the sales department will naturally take into consideration—as they always have done with varying success—the needs of the ultimate user. Moreover, it is usual for them to set these out in order of importance in their literature. If they rely on commonsense and intelligently conducted market research, they will not go far wrong.

Internally, the constant posing of the now traditional questions as where, how, and why jobs should be done and can they be done better, will supply the answers arising from any study entering under the classification of ergonomics. Even if there be such adverse influences as excessive noise, or other nuisances, they too would receive attention under the "be done better" clause. Ergonomics is as old as the industrial revolution and the introduction of a new word to the standard dictionaries does not imply the birth of a new science, but merely gives a name for the age-old technique. Where these new words do some good is to draw increasing attention to worthwhile phases of human activity which are generally insufficiently appreciated.

World Metal Congress

Last weekend, the World Metal Congress opened with a "full-house" at the Hotel Sherman in Chicago and an address of welcome to the 500 overseas guests began the proceedings. During the Congress in Chicago over the seven days beginning Saturday, November 2, six other societies co-operated with the American Society for Metals in the technical proceedings. To top this, the ASM-sponsored Second World Metallurgical Congress held the final week of its tours through American industry. Likewise, at the Metal Exposition, almost 500 firms booked space for showing their wares and services—a record both in number and in space. For 94 separate technical meetings or discussion groups, no fewer than 385 papers were prepared and eight study tours were organized. Rather surprisingly, almost 25 per cent. of the technical and scientific papers presented in Chicago related to metallurgical problems attending the harnessing of atomic energy.

Technical sessions started Saturday morning and carried over Sunday in a four-session sequence. Much of the phenomena associated with the solidification of metals was discussed and pertinent to foundrymen, for example, were papers by Adams of Massachusetts Institute of Technology and Walker of General Electric Laboratories, who dealt with the structure of ingots and castings. Their discussions emphasized the practical requirements of having to pour metal into moulds with sufficient super-heat to fill the mould cavity and then allow the forces of crystallization, thermal gradients, undercooling, nucleation and concentration gradients to have their effect. Pure metals such as iron, nickel and copper might undercool as much as 200 deg. C. in solidifying, they stated, and usually produce coarse-grained structures. Castings or ingots usually comprised: (1) a chill zone (fine grains); (2) a columnar zone (coarse grains), and (3) a central zone (of equi-axed grains). Undercooling and the presence of impurities in metals, including gases, provided nucleants which produced fine grains.

Other main topics dealt with in addition to atomic energy projects, included those concerned with jet-propulsion and elevated-temperature properties of metals.

Symposium on Industrial Health

A symposium on "The Health of the Worker, with reference to the Control of Dust and other Respiratory Diseases," organized by the Royal Society of Health, took place in the Smethwick Baths assembly hall, Thimblemill Road, Smethwick, yesterday. The papers given were: "Control of Dust Hazards" by W. B. Lawrie, M.B.E., M.SC., F.R.M.S., A.I.M. (H.M. Engineering Inspector of Factories); "The Problem of Pneumoconiosis and Silicosis" by W. Jeaffreson Lloyd, M.A., M.B., B.CHIR., M.R.C.S., L.R.C.P. (lecturer in occupational health, University of Birmingham, and chief medical officer, Guest, Keen & Nettlefolds Limited); "The Worker with Chronic Chest Disease" by J. P. W. Hughes, T.D., M.D., D.P.H. (chief medical officer, Albright & Wilson Limited) and "Tuberculosis in Industry" by C. W. Lowe, M.D., PH.D., D.P.H. (lecturer in social medicine, University of Birmingham, and medical officer at the Witton works of General Electric Company, Limited).

The lectures were followed by discussion and luncheon was arranged at the Blue Gates Hotel. Arrangements were made for works visits in the afternoon.

Dinner

BRITISH BRONZE & BRASS INGOT MANUFACTURERS ASSOCIATION

The annual dinner/dance of the British Bronze & Brass Ingot Manufacturers Association was held last Saturday at Grosvenor House, Park Lane, London, W.1. Among the well-known personalities from the industry who occupied the president's table were: F. Baugh (president), Kenneth Thompson, M.P. (assistant Postmaster General), P. B. Higgins (president, Association of Bronze and Brass Founders), Dr. A. B. Everest (president, International Committee of Foundry Technical Associations), D. Carter (assistant secretary, Board of Trade), M. C. Elton (president, National Association of Non-Ferrous Scrap Metal Merchants), V. C. Faulkner, B. Endlar (chairman, Federation of Light Metal Smelters), L. H. Cleaver, J.P., D. Fishwick, O.B.E. (Board of Trade), T. J. Tarring and L. G. Beresford, most of whom were accompanied by their ladies.

After the "Loyal Toast" proposed by the president, the toast of "The Association" was proposed by Mr. Kenneth Thompson and Mr. Baugh responded. "Our Guests and Ladies" was proposed by Mr. J. N. Cohen (past-president of the Association) and Mr. P. B. Higgins replied. After the dinner, there was dancing and a cabaret.

European Foundry Apprentice Competition

The competition week of the European Foundry Apprentice Competition is to begin with a reception by the Chief Burgomaster of Stuttgart, Dr. Klett, on November 25, in the City Hall, and among those who will address the assembly will be Mr. W. Hoevelmann, president of the Federal German foundry organization; Mr. R. Guerin, of the French national foundry association, president of the International Competition Board; and Mr. L. Frede, president of the training and education sub-committee of the European Committe of Foundry Associations. Other speakers will represent German industry generally and the German Ministry of Education.

All the competitors, judges and observers attending from the participating countries have received invitations to the reception, and the British delegation will be attending. Following the reception they will be the guests of the Chief Burgomaster at luncheon in the Ratskeller. The competition will take place at the senior foundry training school, Bad Cannstatt, a suburb of Stuttgart, and the results will be announced and awards presented at a closing ceremony in the Kurhaus, at Bad Cannstatt, at 11 a.m. on Saturday, November 30.

Indian Trainees at Corby

Advance guard of the 300 Indian university graduates who are to be trained in Britain as supervisors for the steelworks which is being built at Durgapur, Bengal, a party of some 20 trainees visited the Corby works of Stewarts and Lloyds, Limited, on November 2, and were able to study at first hand the operations at a major British works.

The Durgapur works, designed to provide initially 1,000,000 tons of ingots a year, is being built by British firms.

Plaster Moulding of Beryllium Bronze*

By Louis Grand

[*Abridged*]

The benefits derived from substituting plaster for moulding sand in the casting of beryllium bronze are, first, an improved surface finish, enabling the impression to be polished without machining or filing, and, second, an increase in the fineness of pattern detail due to the low thermal conductivity of plaster. In the following article these advantages and the methods employed in plaster moulding are discussed in detail.

A study has been made of the casting of beryllium bronze in plaster moulds for the production of decorative objects in plastics, notably plastic boxes imitating cut glass which nearly always carry fine details. They are made by hand moulding, more often than not as one-off jobs, of which the dimensions do not exceed 10 by 8 by 2½-in. Dimensional accuracy was not of great importance and has not been considered.

The following is the composition of what is wrongly termed beryllium *bronze:*—Be 1.8 to 2.0; Ni 0.3 to 0.5; Fe 0.1 to 0.3; Si 0.1 to 0.3 per cent. with traces of Mg and Al. (" Bronze " is a misnomer for the alloy because, of course, it contains no tin. In this respect, however, it is no different from several other pseudo-bronzes, notably manganese-bronze—Editor.) The temperature at the start of solidification is in the neighbourhood of 980 to 1,000 deg. C. and that at the end of solidification of the order of 880 to 900 deg. C.

Setting of Plaster

The faithful reproduction of an impression made is possible in so far as the plaster makes close contact with the smallest detail of the pattern. This presupposes that the air is perfectly expelled from all the cavities and that the slurry remains fluid sufficiently long to allow the imprisoned air to get away. When it is necessary to slow up the setting of the plaster in order to conserve its fluidity, it is best to make an addition of an " inhibitor " to the water used. For this, the author has used glycerine and methyl alcohol.

The speed of the setting has been evaluated by measuring, all other things being equal, the heating up of the plaster tempered with water or with the water to which 10 per cent. of glycerine or methyl alcohol has been added—in a calorifuged surrounding, as is shown in Fig. 1. The mixtures used are shown in Table I.

TABLE I.—*Composition of Mixtures Tested.*

Mixture.	I.	II	III.
Plaster in gm.	600	600	600
Water in ml.	360	324	324
Alcohol in ml.	—	36	—
Glycerine in ml.	—	—	36

The measurements which have no pretensions to scientific exactness are set out in a series of curves in full and broken lines in Fig. 2. The broken lines show the relation between the rate of setting and the concentration of the alcohol solution (curve II) and glycerine (curve III) for the values of the concentration equal or less than 30 per cent.

Stability of Plaster

Tempered plaster, when it is heated in air, loses the whole of its water of crystallizations except two molecules (SO_4Ca, $2H_2O$). It rehydrates quite easily if it is not carried beyond above 300 deg. C. About

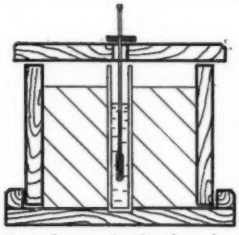

FIG. 1.—*Method of evaluating setting speed of plaster.*

that figure hydration is correspondingly slower as the heating is carried to higher temperatures.

Plaster moulds which have been in stock for some little time should therefore be heated to a temperature somewhere below 300 deg. C. The

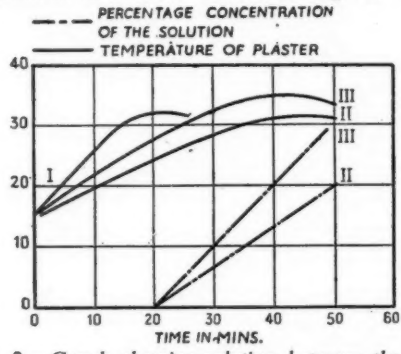

FIG. 2.—*Graph showing relation between the rate of setting for plaster and the concentration of alcohol and glycerine solutions.*

drying, like the hardening of pieces of plaster heated in air, proceeds from the outside to the centre. This factor is less favourable to the development of porosity than dehydration, even partial, of the

* Extracted from *Fonderie*. The Author is on the staff of the Compagnie Pechiney.

mass throughout its thickness since the plaster is still soft.

For this reason, it has sometimes been thought wise, before complete dehydration, to cure plaster moulds in a 24-cwt. pressure autoclave. This pressure corresponds to a temperature of the order of 120 deg. C. at which the plaster loses a molecule of water of crystallization without sensibly hardening.

The baking in an autoclave has been successfully applied to the making of plaster moulds to be cast up in light alloys. It is of no interest for moulds to be used for making beryllium bronze castings. They are satisfactory with a simple air drying at between 200 and 400 deg. C. The plaster calcined about 960 deg. C. decomposes into chalk, oxygen and sulphur gases[1]. Certain foreign bodies, such as oxide of iron, kaolin, silica, alumina, carbon, etc., when mixed in with the plaster are liable to lower the temperature of decomposition[2]. At first thought

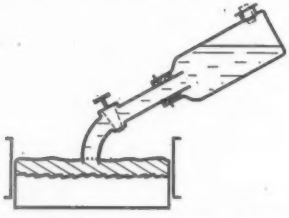

FIG. 3.—*Method used in pouring plaster on to the pattern.*

it would seem to court failure to use plaster moulds for the casting of the copper beryllium alloy which in sand moulds is usually carried out between 1,050 to 1,200 deg. C.

Preparation of the Mixture

Numerous formulae have been given in technical literature[3] and include mixtures of plaster with asbestos, kaolin, talc, sand, silica flour, clay, to which there are sometimes added silicate of soda, sodium chloride and inhibitors for slowing up the setting.

Asbestos, which is of interest from the point of view of mechanical strength, tends, all things being equal, and especially when existing as fibres, to thicken up the slurry which goes against the making of excellent mould faces free from air bubbles.

Mixtures carrying a proportion of talc of the order of 15 per cent. have a tendency to sweat during the setting, particularly if the percentage of water is high (1½ times the weight of the mixture). Under the same conditions (percentage composition, degree of hydration) mixtures with a kaolin base do not sweat. The aptitude of kaolin to retain water favours the development of pores in the heart of the plaster moulds.

Experiments have been made with asbestos, talc and kaolin, and they have given satisfactory results, which are set out in the section headed "casting." Silica flour or other refractory powders have not been tried out, but other writers have claimed success.[4] Clay has been turned down for the purpose envisaged in view of its contraction at high temperatures. The incorporation in the plaster of silicate of soda to improve cohesion and of sodium chloride as an "anti-softener" have been tried out. As a trial, small quantities (about 1.5 to 2 per cent.) of powdered silicate of soda have been introduced into the mixture and also a 15 gm. per litre solution of sodium chloride for tempering has been tested.

The simultaneous presence of silicate of soda and sodium chloride brings about a serious deterioration of a plaster mould, when cast up with a bronze at temperatures ranging between 1,050 and 1,110 deg. C., even if one coats the mould cavity with sillimanite or limewash. Some, though insufficient, protection is given by a graphite coating.

The reaction of the metal with the mould is quite slight if one refrains from adding the silicate or using salt water for tempering. Finally, no

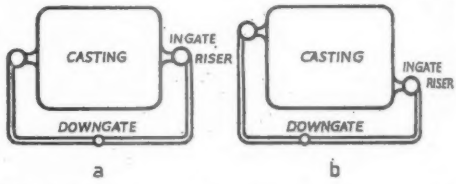

FIG. 4.—*Two running systems used in pouring castings.*

reaction has been noticed with graphite-coated moulds made up from a mixture containing 1.5 to 2 per cent. silicate of soda made up with pure water.

Tempering of Plaster

Pulverized products, dry-milled with plaster, have been tempered, thereby avoiding the entrainment of air and then poured on to the pattern using as a precaution the method shown in Fig. 3. To confer upon the plaster a sufficient stability below 1,000 deg. C., a certain percentage of foreign matter has been mixed, to the approximate extent of about 20 per cent. to avoid cracking during drying and casting. The volume of tempering water to be used should take into consideration not only the quantity needed to change the anhydrous sulphate into dihydrated sulphate and for ensuring the liquidity of the slurry, but also limiting the degree of porosity in the plaster moulds.

Rejects have been noted on castings poured in moulds prepared from the following mix:—plaster 85; kaolin 10; and asbestos 5 per cent., tempered with a weight of water equal to, or less than, the weight of the mix. The moulds were first dried in air for 12 hours, then at 230 deg. C. for 20 hours, and at 400 deg. C. for 8 hours, and sometimes at 625 deg. C. for 6 hours. The rejects disappeared when the water addition was increased

from 20 to 30 per cent. Be that as it may, one should naturally abstain from utilizing an excessive quantity of water in spite of this, as it is well known that plaster loses its cohesion ("dead" plaster).

Pattern

Plaster can adhere to the pattern, quite apart from the material used in its make-up (metal, plaster, or wood patterns, suitably varnished), especially when the cavity contains fine detail and in particular when the taper is inadequate. In this case, it is necessary to lubricate the mould cavity with a liquid or solid medium so spread as not to change in any way the profile of the detail. It is often necessary with this end in view, to dilute the medium used with a volatile liquid. Success has been achieved with a solution of petroleum ether and light fuel oil (fuel ½ and ether ½) or paraffin (30 to 100 g. per litre) according to the nature of the mould cavity; a solution of trichlorethylene mixed with 50 per cent. stearine and 50 per cent. red grease, and linseed oil again diluted.

Soap can equally well be used, if precautions are taken against the formation of a foam or jelly which would produce air bubbles in contact with the pattern. It is sometimes found, even when paraffin is used, that there is difficulty with cold stripping. This can be overcome by lightly heating the pattern to 40 to 50 deg. C. (100 to 120 deg. F.).

Drying

Plaster moulds should be dried before being used for the casting of bronze. The time of drying, which varies a little with a furnace temperature running between 200 and 400 deg. C., entirely depends on the weight and thickness of the casting. As an example, blocks of 3¼ by 3¼ by 2 in. made from 80 per cent. plaster, 5 to 15 per cent. kaolin and 1.5 to 5 per cent. powdered asbestos, tempered with 1.5 times their weight with water, were completely dehydrated after 5 to 6 hours heating at 200 to 400 deg. C. in an air-circulating furnace.

Permeability

The instrument used for measuring the permeability of moulding sands was inadequate for evaluating the plaster moulds prepared as indicated. The permeability is of a microscopic nature, yet it is adequate for moulding for making castings in beryllium bronze.

Mechanical Properties

In a table (not reproduced) the transverse shear and crushing strengths have been set out for the various mixtures, dehydrated at between 200 and 400 deg. C. It shows that the mechanical properties of the moulds diminish as the foreign matter incorporated in the mixture is increased and for the same mix, if the volume of water used for tempering is too high. For a quantity of water equal to 1½ times the weight, these properties are practically zero. In this connection, it is best to use about the same weight of water as that of the mix, and if required, to add an inhibitor to slow up setting. The mechanical properties of mould also diminish if the curing temperature is beyond 200 deg. C. The transverse strength drops about 50 per cent. and when the temperature is raised from 200 to between 230 and 400 deg. C.

Casting

Castings measuring 8 by 4 by 1¼-in. were poured at 1,050 deg. C. using the running systems shown at (*a*) and (*b*) in Fig. 4. The moulds were made up with a mixture of 81 per cent. plaster, 2 per cent. powdered asbestos, 10 per cent. talc and 7 per cent. kaolin, tempered with 1.2 times its weight of water. These moulds were heated to about 200 to 230 deg. C. The central part of the castings moulded according to the method shown in sketch (*a*) were spongy and showed a markedly dendritic structure. The same castings teemed under the same conditions in green-sand showed no apparent defect. Those cast in plaster according to system (*b*) (Fig. 4) were satisfactory as to surface finish.

This example shows what could have been prophesied: that certain foundry defects (microshrinkage, draws, etc.) ascribed to initial moulding conditions, and in particular those which cause "hot spots," are worsened in the case of plaster moulding because of the low thermal conductivity of the moulds. The influence on the quality of the casting by the temperature gradient during solidification would appear to be more marked than in the case of sand moulding. Wherever possible, it is best to use casting under pressure.

So far as the low thermal conductivity of plaster moulds is concerned, it is possible, all things being equal, to lower the casting temperature by about 70 to 80 deg. C., which really seems to lower the loss of beryllium, through atmospheric oxidation during melting and casting, which normally can be put at 3 to 5 per cent. of the content with an average of about 1.9 per cent. This point well merits consideration because of the high price of beryllium.

Mixtures used for reproducing finely-chased work were made from those shown in Table II. The mixtures were in each case with 150 ml. of water for 3 min., because, for the casting to be made, it was necessary to sacrifice mechanical strength of the mould to receive the benefits to be derived from the fluidity of the slurry.

TABLE II.—*Plaster Composition Used for Fine Work.*

Test No.	Percentage composition.			
	Plaster.	Kaolin.	Talc.	Asbestos.
75	80	10	—	10
76	80	5	—	15
77	80	—	15	5
78	80	15	—	5
79	80	15	—	5

The moulds were dried in air for about 12 hours and then heated to 230 deg. C. (Test No. 79) or to 230 deg. and then to 400 deg. C. for the rest. None of the moulds reacted when in contact with beryllium bronze at 1,050 deg. C. Rejects were always shown on the sharp angles in the central

Plaster Moulding of Beryllium Bronze

part of the test casting, No. 79. It can be surmised that the defect is due to the slight rehydration of insufficiently cured plaster. When the casting temperature is low, something of the order of 1,020 to 1,030 deg. C. maximum and if the mould is intelligently designed and gated (no hot spots), the surface condition of beryllium bronze castings will be equal to die-cast components.

This statement is true for test moulds numbered 75 and 79 and for numerous other moulds of which the composition is of the order 80 to 82 per cent. plaster, less than 15 per cent. talc, less than 15 per cent. kaolin, and 1 to 5 per cent. asbestos tempered with 1 to 1.2 times its weight of water. If the casting temperature be too high and if the moulding conditions be ill planned, the dendritic structure of the metal shows through the as-cast skin to which it gives a more or less marked tree-like aspect.

According to moulding conditions (mould design, temperature of the metal) which do not bring about any alteration in the surface of the castings made in green sand, plaster-moulded castings can show up locally a spongy appearance (microshrinkage) and also sometimes simultaneously, and in the same places, cracks due to lack of feeding.

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[2] Gallo. *Giorn, chim. ind.*, 9 to 405, 1927.
[3] K. A. Mierike and E. S. Johnson. A New Permeable Metal Casting Plate. *Trans.* A.F.A., 56, pp. 479 to 485, 1948.

Trading with China

United Kingdom exporters who have had no previous experience of trading with China and who are now thinking of entering this market may find the following information about methods of trading useful.

For all practical purposes, there is no private trading in China. All imports and exports are handled by state trading corporations, which are responsible for negotiating prices, deliveries, terms of payment, etc. The senior corporation is the China National Import and Export Corporation (CNIEC), which at one time handled all imports and exports, but has now delegated its responsibilities for most commodities to a number of specialized trading corporations. Occasionally, enquiries may be received from what appear to be private firms operating in China, but these are invariably joint state/private enterprises and in all cases it can be assumed that they are acting under the control of the appropriate state trading corporation.

Firms who wish to establish whether there is a market for their goods in China should write giving full details of the products they have to offer to the state treasury corporation concerned. In the case of castings this is the China National Metals Import Corporation; and for machinery, the China National Machinery Import Corporation, both at Erh Li Kou, Outside Hsi Chih, Men, Peking, China; for pig-iron and non-ferrous ingots the address is China National Minerals Corporation, 3, Pao Chan Sze Street, Peking, China.

Further assistance and advice on trading with China may be obtained from the Sino-British Trade Committee, which comprises representatives of the Federation of British Industries, the National Union of Manufacturers, the London Chamber of Commerce, the Association of British Chambers of Commerce and the China Association. Firms may get in touch with the Committee either through one of these constituent organizations or through the co-ordinating secretary, Mr. R. D. F. Marlow, at the London Chamber of Commerce, 69, Cannon Street, London, E.C.4.

* Any general enquiries regarding this notice or on trade with China generally should be addressed to the Commercial Relations and Exports Department, Board of Trade, Horse Guards Avenue, London, S.W.1 (telephone: Trafalgar 8855, extension 2619). (Quoting C.R.E./4952/56.)

EXCLUSIVE BRITISH RIGHTS for the manufacture and sale of Thomson Ball Bushings, linear bearings which are widely used in America, have been acquired by the Ransome & Marles Bearing Company, Limited, Newark (Notts).

Exhibition Briefs

Details are given below of some of the products of interest to the foundry industry which are on show at the current Building Exhibition at Olympia, London. Closing date of the exhibition is November 27.

HATTERSLEY BROTHERS, LIMITED, of Swinton, Yorkshire (*stand 523, Grand Hall Gallery*), are exhibiting their solid-fuel-heating appliances.

UNITED STEEL STRUCTURAL COMPANY, LIMITED, a subsidiary of The United Steel Companies, Limited (*Stand P229, National Hall*) will be showing a new form of connection for structural steelwork which replaces the conventional riveted joint and increases the speed of erection.

The new system, which employs high strength torque bolts, establishes considerable tension in the individual bolts so that the strength of a joint is developed by friction at the interfaces of the connected sections. The torque bolts have been developed in collaboration with United Steel's central research and development department and have been successfully tested in a number of actual structures.

Samuel Fox & Company, Limited, another United Steel subsidiary, will display on the same stand a special stainless-steel panel which has been developed for curtain walling construction.

SIEMENS EDISON SWAN, LIMITED (*stands 25 and 26*) are showing, pictorially and by means of actual exhibits, the way in which their products are used to bring electricity from the power station, and distribute it throughout the factory, office and home. Exhibited for the first time is a new tubular heater with pilot light which has been developed to meet the demand for a tubular heater giving visual indication that it is switched on. Whenever the heater is in operation a light projects forward into the room, on to the floor, and backwards on to the wall, through narrow slots at one end of the tube. Tubes, which have a loading of 60 watts per ft., are available in lengths ranging from 2 to 12 ft.

A selection of fluorescent, tungsten, and mercury lamps are shown in appropriate fittings, which include the company's street lighting lantern, ceiling fitting, and semi-recessed fluorescent lighting fitting.

The use of trunking for factory lighting is shown, and the company's emergency lighting system, which takes over the lighting when a power failure occurs, is demonstrated.

RUSTON-BUCYRUS, LIMITED—Mr. L. E. P. Tylor has accepted an invitation to join the board.

"The Research Association"

Dr. Pearce's Conference Contribution

At one of the sectional meetings associated with last week's national conference of the British Institute of Management, held in Bournemouth, Dr. J. G. Pearce, C.B.E., director of the British Cast Iron Research Association presented a paper entitled "The Research Association—an Aid to Firms Great and Small." After giving in some detail the position and status of his own Association *vis à vis* the ironfounding industry of this country and mentioning how its services were organized, Dr. Pearce went on to deal in more general fashion with the value of such services to industrial managements. Amongst his observations, was the fact that the Association had a Research Department for experimental investigation, a Development Department for direct assistance to member-firms on day-to-day problems and on the application of research, and casters, and an Intelligence Department for the preparation and distribution of documentary material.

While the large foundry was interested in the Association's research and development plan because it had men who could follow it and apply the results, the small foundry was mainly concerned with direct assistance in day-to-day problems. This was best provided by personal contact effected through the Association's development department, the matter being dealt with according to its character by members of either the development or the research staff.

At intervals, short courses of several days duration and dealing with a specialized field, were held and, recognizing the need for at least one technically knowledgeable man in each foundry, the Association had fostered the establishment of the National Foundry College which to date had already trained some 200 men.

As far as management and management's attitude were concerned, it was evident that a research association should be interested not only in operations but in working conditions, productivity and the industrial complex about which management might require information as a prelude to action. To this end, management should inform itself of the facilities available to its company and regard as its responsibilities the bridging of the gap between production and technical personnel. The potential value of a research association increased the more it was used and consulted by industry, he said, for only in this way could reconciliation be effected between empirical and scientific knowledge. Management should appreciate that an experimental programme concerning processes subject to several variables might be less satisfactory than a statistical examination based on available works records.

Dr. Pearce concluded by saying that if he had seemed to stress the development rather than the research aspects of the Association's work, it should be remembered that whilst a function of the development department was to apply the findings of research to industry, it was the research front which provided the raw material for this.

THE RHEOSTATIC COMPANY, LIMITED, of Slough, have announced that their business in connection with central heating is conducted entirely through the heating contracting industry and the manufacturers of central-heating plant. It is thought an erroneous impression might have been given by the report (JOURNAL October 17, p. 478) of the new plant designed by the British Coal Utilisation Research Association.

Kent's Mobile Exhibition

Gossip as to a forthcoming depression is not usually helpful, but if it engenders in the sales department of a firm an incentive for novel action, then it has a little on the credit side. One noteworthy action for the selling of foundry products has been evolved by George Kent, Limited, of Luton. The firm has fitted out a motor-coach as a mobile exhibition, which is to tour the Continent calling on the firm's customers. Built on a Dodge chassis and powered by a 4¾ litre diesel engine, the vehicle is 32-ft. long, 12-ft. high, 8-ft. wide and weighs 7 tons. The interior (shown in the accompanying illustration) is panelled and carpeted like a lounge, many and varied types of instruments from the firm's range being displayed.

The coach has been so equipped that an air compressor can be connected up to the electricity mains supply so that instruments can be shown under pressure and there is a 24 v. battery-driven rotary generator for providing a stand-by electricity supply. Above the driver's cab, the Kent emblem is illuminated, whilst the rear of the vehicle will carry the name and address of the local representative of the country through which it is passing. The first port of call was the Interkama Exhibition at Düsseldorf, and the mobile exhibition is now touring Western and Central European countries.

Interior of the motor-coach equipped by George Kent Limited, for use as a travelling showroom and demonstration unit.

Equipment and Supplies

Gas Refrigerating Machine

Philips Electrical, Limited, Century House, Shaftesbury Avenue, London, W.C.2, announce that their gas refrigerating machine is now available in a new version – the P.W. 7000. In its new form, it is a compact, electrically-driven, single-cylinder unit, capable of producing five litres of liquid air or liquid nitrogen an hour, within 15 min. of starting up. The design of the equipment is claimed to be unique in that the gas to be liquefied does not undergo compression or pass through any working parts; by this means a pure product is assured. The machine will produce liquid gas from those gases which will liquefy at above –200 deg. C., and temperatures of –80 deg. C. to –200 deg. C. can be achieved in a single stage. Under normal conditions, the machine requires only one hour for defrosting and draining of the freezer after 16-20 hours' production. Moisture and carbon dioxide are removed simply by freezing. Among the processes in which the machine can be used as ancillary equipment are cold machining, artificial ageing of alloys in accelerated tests, cold shrinking, low-temperature annealing and the hardening of steel.

Die Material

A paper, appearing recently in abstract in the American SAE *Journal* describes the use of Gmoodie a low-cost zinc-base casting alloy for dies. It is claimed that the material, which is not available in the UK. can, when used in drawing, forming, flanging and bending dies, produce 5,000 to 200,000 steel stampings, depending on the nature of the work. The increased wear, it is reported, results from alloying nickel and titanium to form hard intermetallic constituents in the softer zinc-base matrix.

Although more expensive than the conventional zinc-base die alloy, it is more than 95 per cent. recoverable on melting. The paper states that the material shows no advantage over conventional zinc-base tooling where a very low volume of parts, a few hundred for instance, are required.

Skin-cleansing Creams

Scientific Pharmacals, Limited, 1, Eden Street, Hampstead Road, London, N.W.1, announce that the Kerocleanse range of skin-cleansing creams are now being made available to industrial users. The No. 21 preparation is for use by persons handling materials likely to stain the skin, while No. 22 is intended for removing deposits of adhesives and resins picked up by the hands in the course of manufacturing processes. It is claimed to be effective against epoxide, Araldite, furane, urea-formaldehyde, phenol-formaldehyde, resorcinol-formaldehyde resins and glues and also rubber-based adhesives. The third cream in this range, No. 23, is for removing deposits of viscous oils from the skin. All these creams are claimed to be hygienic and economical and are said to reduce the incidence of dermatitis and allied skin troubles.

Induction Heater

General Electric Company. Limited, Kingsway, London, W.C.2, have increased their range of induction heaters suitable for bronzing or surface hardening by the addition of a new mercury-rectifier type of unit, of 18 kw. output (36 kw. input), occupying only 11 sq. ft. of floor space. With the maximum output, the input feed is at approximately 36 kw., and impedance matching is obtained by means of a power-output control varying the coupling to the heater coils. The frequency is some 500 kilocycles per sec., and the unit is contained in an enamelled cabinet fitted with retractable transmissions, the various controls and indicators being mounted on the front panel.

Water Meters

George Kent, Limited, Luton, announce the introduction of an entirely new class of trade water meters, known as the "Compound," for the measurement of widely varying cold-water flows. The "Compound" meter, which supersedes the "Torrent Combination" meter, has a wide measuring range, which in the case of the 3 in. is over 500:1 within accuracy limits of 2 per cent. To achieve this range, two separate measuring units are used, one for high and the other for low flows, both of which, with an automatic change-over valve to select the unit required, are contained in a single compact meter body. Only one measuring unit can register at a time.

Spray-gun Nozzles

Alfred Bullows & Sons, Limited, Long Street, Walsall, Staffordshire, announce the introduction of two additional air nozzles for use with their lightweight "Model 19" spray gun to supplement the existing range and give greater scope. The new nozzles are the 63PB, for use on pressure feed and with any of five material nozzles varying from 0.040 in. bore to 0.070 in. bore, and the 67SA to operate with the 67 material nozzle of 0.086 in. bore. The latter is designed for use with a syphon cup and is suitable for use with heavy primers, fillers and cement paint, for which it is stated there has previously been no suitable suction-type nozzle available.

Flexible Core Vents

Following requests received from readers of this JOURNAL for a source of supply for flexible open-weave venting tubes for foundry purposes, enquiries were made by the Editorial staff, with the result that this new type of core vent is now being manufactured by L.M.S. Products Limited, 318, Paisley Road, Glasgow, C5. Made from a special textile material, these flexible vents permit rapid escape of gases from the start of the casting process, thus eliminating a possibility of blowholes. Incorporation of the tubes is also claimed to be ideal for CO_2 gassing of cores and moulds. "Corvent," as it is called, is available in nine sizes, from $\frac{1}{16}$ up to $\frac{3}{4}$ dia. and samples are available from the address quoted.

Core-sand Mixes

In Mr. R. M. Chapman's paper which appeared on page 395 of the JOURNAL of October 3, under the title "Some Steelfoundry Mould and Core-sand Mixes," reference was made at the head of the second column on page 396 to the use of accelerators containing the peroxide group in conjunction with cold-setting sands. In this connection, the Fordath Engineering Company, Limited, of West Bromwich, have requested that readers' attention be drawn to the fact that they are exclusive licensees under British Patent No. 653,530 which relates to the use of such accelerators, which are supplied by them under the trade name "Glyso-Corovit."

Joint Iron Council's Report

Repercussions of Fiscal Policy on Customer Industries

[ABRIDGED]

At the annual convention of the Joint Iron Council held in London on November 5, the sub-committee presented its report to June, 1957:—

The report covers the period January 1, 1956-June 30, 1957, in order to incorporate a review of the activities of the Council of Ironfoundry Associations during 1956 and so to avoid the repetition resulting from the publication, as previously, of two separate reports. In what follows the main points of this comprehensive report have been abstracted.

In the Joint Iron Council's report of last year, attention was drawn to the measures being taken by the Government to combat inflation and improve the country's balance of payments position. Throughout the 18 months under review these same policies were being followed and their effect on the industrial activity of the country has become increasingly apparent. There has been a slowing down in the rate of growth of demand for capital equipment; expenditure by public authorities has fallen while the tightening of hire-purchase control has adversely affected the automobile industry and other important customer industries of the iron-foundry.

The Government's policies have achieved much success in improving the balance of payments position, some success in bringing about a measure of redeployment of the labour force, but little or nothing has been achieved towards solving the most important problem, that of inflation. Measures taken in the Budget and some easing of the credit stringency during the first half of 1957 might have indicated that a more expansionary phase for industry lay ahead but recent pronouncements from the Treasury show that the Government is still undecided on what positive policies to follow*.

The gains of Government action in the past may outweigh the losses, yet those losses in the form of unused industrial capacity and bad trading conditions must be taken into account in any review of policy. As a result of the recent wage awards the whole country's economy has been lifted on to a higher basic-cost plateau and it will not be apparent for some time how far this may affect competitive strength in overseas markets and, through this, the balance of payments position. As the prospect of a free-trade area appears to draw closer the maintenance of export strength through reduction of costs and a consequent strengthening of sterling become even more the central factor in Britain's success as a country dependent on international trade.

State of Trade in the Industry

The underlying policy of restraint adopted by the Government, the fuel difficulties arising out of the Suez Canal crisis, and lastly the strikes in the engineering industry have all had their repercussions on the foundries. The total output of iron castings after reaching record figures in the first and second quarters of 1956 began to be affected by the continuing recession in the motor industry in the third quarter. This recession spread to other industries in the last quarter and iron castings production was quite severely affected. The strikes in the engineering and shipbuilding industries in March accentuated the general poor trading conditions of the first quarter of 1957, while despite a marked increase in output of castings for the motor industry, the second quarter showed little overall improvement.

Castings production for the automobile industry showed a steady downward trend throughout 1956, but under the influence of the improved situation in the industry itself production rose slightly in the first quarter of 1957 and had risen almost to record levels in the second quarter. Ingot mould output, with the exception of the three months, April/June, 1957, when a small reduction was shown, continued to establish new records throughout the period. The production of pressure pipes held steadily in advance of previous quarters up to September, 1956, but fell back in the last quarter and again fell in the first and second quarters of 1957. Iron casting production for the building industry has been maintained at rates appreciably above those for previous years both in 1956 and the first half of 1957. Production of castings for the closely allied domestic durable goods section, however, fell back during 1956, but had recovered in the first half of 1957.

The output of castings for the engineering industry in general ran slightly above 1955 throughout 1956, this being particularly notable in the case of machinery and the electrical engineering section. The strikes in the engineering and shipbuilding section affected the first quarter's output in 1957 and the second quarter showed a further decline. In the railway equipment section, the railway-modernization scheme caused a strong increase in demand and output throughout the period. The general easing in the rate of production of the foundries has had its effect on the production of pig-iron and this has been intensified by a slightly increased use of scrap in the metal charge. Surpluses have been particularly evident in the case of refined iron and high-phosphorus pig-iron. Several blast-furnaces have now changed over to the making of basic iron for steelmaking and substantial tonnages of foundry and refined iron have been exported. (For production statistics, subdivided according to use, see Table I.)

Iron and Steel Board

The last annual report referred to the forecast of iron castings production in 1960 which was being

* Since the completion of this report the bank rate has been raised.—Editor.

Joint Iron Council's Report

extended to 1962. This forecast, which was submitted to and accepted by the board on the basis of certain broad economic assumptions, shows an anticipated output in 1962 of 4½ million tons.

Pig-iron

The maximum permitted prices of pig-iron were increased by the Iron and Steel Board in December, 1956, by an average of 6 per cent. These increases followed a comprehensive review by the board of the price-structure in relation to operating and capital costs, to capital employed in the industry and the programme of current and future development. The price-changes also reflect the increases in the cost of production due to transport, wages and raw materials. A further increase took place shortly after the period covered by this report when, on July 29, 1957, maximum prices of pig-iron were raised by an average of 6½ per cent.

In January, 1957, the Board of Trade announced restrictions on the export of pig-iron. These were severe and representations were made to the Iron and Steel Board, which resulted in some concessions being obtained. Due to falling demand at home, stocks of iron rose substantially, and further representations were made by the Council of Iron Producers and its constituent associations which resulted in increased allocations being granted. At the close of the period under review the situation was still causing concern. Arrangements were made by the British Iron and Steel Federation to stock a limited tonnage of high-phosphoric basic iron produced in foundry blast-furnaces in an endeavour to ease the position.

Price Control of Iron and Steel Scrap

The Board of Trade increased maximum permitted prices of iron and steel scrap by an average of £2 per ton on May 4, 1956. On January 25, 1957, the ministerial responsibility for the iron and steel industry was transferred to the Minister of Power. No immediate changes were made but shortly after the close of the period under review a new Order increased scrap prices by an average of £1 per ton. On both these occasions protests were made to the Iron and Steel Board.

Coal and Coke

In June, 1956, the National Coal Board announced that it hoped to stabilize coal prices for at least 12 months. In June, 1957, coal prices were increased by an average of 8 per cent. From this increase there have flowed the familiar results; the prices of blast-furnace and foundry coke, electricity and gas have been increased. The Council of Ironfoundry Associations and the British Coking Industry Association have formed a joint committee to examine the quality of foundry coke. Before this committee was formed, questions of coke-quality were discussed at meetings which were held from time to time between the CFA executive committee and the BCIA. Complaints about coke-quality reported to the CFA were not always supported by detailed evidence. As a first step the new committee decided to carry out a series of tests on consignments of coke before they left the ovens and after receipt at the foundries. The results of these tests will be analysed carefully by the committee.

Clean Air Act

Reference was made in the previous report to the Council's intention to press for "scheduling" of the industry's processes so as to bring them under the Alkali Inspectorate rather than the local authorities. Notice of a public inquiry covering England and Wales was received towards the end of 1956 and all ironfounding firms were immediately notified by the JIC of the action proposed. A list of ironfounding processes was subsequently prepared with the help of an advisory panel under the chairmanship of Dr. J. G. Pearce and this list was submitted to the Minister for consideration at the public inquiry. The advisory panel continued to act in the preparation of the case and the director of the Council was entrusted with the task of presenting it and advising on procedure. By arrangement with the British Iron and Steel Federation (on whose Air Pollution Committee a member of the Executive, Mr. G. H. Johnson, was invited to serve), the case for "scheduling" certain processes in the manufacture of pig-iron, as prepared and presented on behalf of the steelmakers was supported by the JIC, but was not separately argued. The case for "scheduling" of cupola melting in the manufacture of refined pig-iron was presented by the JIC.

The inquiry for England and Wales began in London on May 27, under the chairmanship of Sir Frederick Armer and continued for approximately two weeks. The JIC's case, in the presentation of

TABLE I.—*Iron Castings Production According to Use (Grey and Malleable).*

Main fields of consumption.	1955 (tons).	1956 (tons).	1957* (tons).
Buildings and municipal (pipes, gutters, man-hole covers, baths, sanitary goods)	316,000	324,600	345,600
Cooking and heating apparatus, including radiators	225,300	197,700	200,000
Other domestic appliances	11,400	9,700	11,400
Pipes and fittings for gas, water, sewage, etc.	702,600	684,300	569,800
Coal mining	38,800	39,700	38,200
Gas and chemical plant	47,200	47,200	46,000
Electricity generation and distribution	102,600	118,700	134,800
Motor car and cycle industry (excluding tractors)	363,200	344,500	339,800
Railway equipment	278,900	313,400	358,400
Shipbuilding	80,700	84,200	77,200
Prime movers (turbines, engines) for land use	95,900	92,200	77,800
Boiler house plant for industry, etc.	54,800	54,100	53,200
Agriculture (including tractors)	228,700	165,500	197,800
Machine Tools	203,400	221,600	216,400
Textile machinery	135,700	121,400	102,800
Valves, pumps and compressors	88,000	97,200	96,600
Ingot moulds for steel and non-ferrous metal manufacture	378,300	429,600	437,800
Iron and steel works plant and rolls for mills	129,200	147,000	164,200
Cranes and conveyors for industry, transport, etc.	50,200	57,000	55,600
Printing and paper machinery	31,300	33,000	34,000
Other fields	362,900	316,600	255,600
TOTAL	3,925,100	3,899,200	3,813,000

* Annual rate derived from first two quarters.

which a number of witnesses were examined and full use was made of statistics and diagrammatic and photographic exhibits, constituted the greater part of one day's proceedings. Shortly after the chairman's report has been published, the Minister is expected to make an order scheduling certain processes. A separate inquiry, at which arrangements are being made to present the industry's case, is to be held in Scotland later in the year.

Training and Education

When the CFA training committee reviewed its work towards the end of the period of Conditional Aid grant, the need for more technologists and trained managers appeared as one of the fundamental problems facing the ironfounding industry. This was therefore chosen as the theme of a conference held in London in November, 1956. The Rt. Hon. Iain Macleod, MP, Minister of Labour and National Service, opened the conference, which was under the chairmanship of Sir Harold West. Dr. J. G. Pearce and Dr. A. Ivanoff, both members of the CFA training committee, gave the principal addresses, each of which was followed by a "brains trust" session in which leading men in the industry took part. The conference was attended by 130 senior representatives of ironfounding firms. A full report of the conference under the title "Men, Management and Metal," was published early in 1957 and distributed to all ironfoundries in the United Kingdom.

A considerable number of concrete proposals were made in the course of this conference and others were formulated by the training committee in studying the full report. To assist in evaluating these and to advise the committee on the many developments in prospect, it was decided to set up consultative panels on training and education. Two such panels, one concerned with operative training and the other with the training of managers, supervisors and technicians, have been established. Their membership is widely representative of the industry and they are likely to play an increasingly important role in the development of training for ironfounding.

The two specialized institutions which provide training at different levels for the foundry industry, the National Foundry College and the National Foundry Craft Training Centre, have continued to receive active support during the year. Besides the financial contribution which in the case of the National Foundry Craft Training Centre meets a considerable part of the running-costs, every opportunity has been taken to publicize the work of the two institutions. It is therefore gratifying to record that an increasing number of students from ironfounding companies are applying for admission to the National Foundry College and that considerably more apprentices have attended the Craft Training Centre during the period under review than in any previous year.

Applications for admission to the National Foundry College are made early in the calendar year, and in the first half of 1957 there were sufficient new applicants to ensure that the total number of students in attendance in 1957-58 will be approximately 30 per cent. higher than last year. It is, however, necessary to draw attention to the importance of the educational standards required for admission, and it may be that the CFA training committee will have to address itself in the near future to the means by which the average level of ability of students entering the college can be raised.

The annual report for 1955-56 stated that further development in the provision of craft training for apprentices at the National Foundry Craft Training Centre would require the provision of new premises. During 1957 a situation has arisen in which courses for apprentices who have not attended previously have become fully booked for a year ahead. The management committee of the centre, at the request of the trustees, are accordingly working out detailed proposals for the provision of a new centre to cater for more apprentices. Three further one-week residential courses for ironfoundry supervisors were held during the year at the hostel of the National Foundry College. These courses have continued to be well-attended and highly successful, and an extra course of the same type is therefore being included in the programme for 1957. Several firms support these courses regularly, but the training committee regard it as important that they should not become the province of the larger firms only. This has not in fact happened, and approximately half the men attending each course held so far have been from companies which have not previously sponsored candidates for any form of foundry training course.

The CFA training committee decided that there was a special need for a review of costing and estimating methods in the industry, following the publication in book form of "The Elements of Foundry Costing." A number of one-day study-conferences were therefore planned for the summer months of 1957; the first of these meetings, held on June 27, was well-attended and successful.

The need for textbooks and visual aids to assist in the training of foundry personnel has been under consideration by the CFA training committee. Stocks of the wall-charts on foundry technique, which have been available from the CFA for several years, were exhausted during the year under review, and plans were put in hand to produce a new series. In planning these, the Committee has in mind the need to co-ordinate the work of the several bodies concerned with apprentice training, notably the City and Guilds of London Institute and the Institute of British Foundrymen, with the ultimate objective of defining more clearly the scope and standards of apprentice training.

A number of reports have been published by various bodies on methods of apprenticeship training employed in European countries. The CFA training committee has followed these with interest; when it was learned that a European Foundry Apprentice Competition was being held in Stuttgart in November, 1957, the Committee decided that the United Kingdom should enter a team, although considerable misgivings were felt about the time

Joint Iron Council's Report

available for the industry in this country to prepare for such a venture. Whatever the outcome, it is clear that much will be learned from participation in this competition and the comparison it will afford between the results of continental and British methods of training.

Health and Safety

Mr. H. A. Bonney (chairman, the National Association of Malleable Ironfounders) has succeeded Mr. Gresty as chairman of the Committee, and also as a CFA representative on the joint standing committee. The safety committee has again devoted much of its time to considering the incidence of pneumoconiosis in ironfoundries. It has been hampered by lack of reliable information on the incidence of the disease, but arrangements are in hand which it is hopd will remedy the position. In this connection the committee has considered reports on work carried out at the Dust Research Institute at Bonn and on the activities of the Health and Safety sub-committee of the European Committee of Foundry Associations.

The design of eye-protection for use by men handling molten metal is being studied by a special committee set up by HM Chief Inspector of Factories. The CFA is represented on the committee. Some of the conclusions reached by the committee have reversed views previously expressed as to the suitability of certain materials for the lenses. It is clear that much more research is needed before a suitable goggle can be produced which will be worn readily by the men at risk.

European Common Market

In 1955 the Foreign Ministers of the six members of the European Coal and Steel Community, Belgium, France, Western Germany, Italy, Luxembourg and the Netherlands, drafted proposals for a full customs union between their respective countries. These proposals were embodied in a treaty establishing the European Economic Community which was signed at Rome on March 25, 1957. The treaty is likely to be ratified by the parliaments of the countries concerned before the end of 1957.

Faced with this prospect, the Government began to examine ways in which the UK might become associated with the customs union. The views of industry were sought through the Federation of British Industries on a proposal to set up a European free trade area in industrial goods which would embrace other countries as well as the members of the ECSC; the JIC reported that there was a substantial measure of support in the industry. The Government subsequently decided to enter into an industrial free-trade area. The negotiations to bring this about are still going on.

Many complex problems have yet to be resolved, among them being the base-date tariffs to be adopted upon the establishment of the area and the question of the definition of origin of goods in a free-trade area. On these and other matters affecting the industry, the JIC is being consulted by the Government through the Iron and Steel Board. The Board has been informed that the JIC considers that the base-date tariff should be not less than the current rate of tariff for each class of product concerned. As far as the definition of origin is concerned, the Government decided not to press for more than 50 per cent. content in the proposed definition of origin and it is hoped that a list of materials important in the manufacture of British goods will qualify for free-trade area origin, although derived elsewhere. In addition to the specific matters on which the industry is being consulted through the Iron and Steel Board, the JIC is also joining in discussions with other industries through the FBI.

European Committee of Foundry Associations

The European Committee of Foundry Associations was set up in 1953 in order to bring about some consultation between representative organizations of the foundry industry in France, Germany, Holland, Belgium, Italy, Spain, Austria and Luxembourg. The principal objects of the Committee are:—(1) to study all problems of interest to the European foundry industries, notably those concerned with economic, technical or social questions; (2) to recommend measures for the development and the safeguarding of their mutual and international interests; (3) to collect, exchange and make known information bearing on these objects. There are a number of sub-committees dealing with such matters as industrial health, productivity, market development and training.

The Committee invited the CFA to send observers to a meeting of the Committee held in Brussels on October 22, 1956. Following a report on this meeting and on the activities of the Committee generally, it was decided that the CFA should become a member of the Committee. The British Steel Founders' Association decided to join at the same time. The CFA is participating in the work of some of the sub-committees, representatives having been appointed to the industrial health, market development, publicity and training committees. The work of these committees is referred to elsewhere in the report.

Transport

The last annual report referred to the satisfactory results which had been achieved as a result of the objection to the British Transport Commission (Railway Merchandise) Charges Scheme which had been lodged with the Transport Tribunal by various traders' organizations, including the JIC. The final decision of the Tribunal contained the amended scheme and fixed the date of commencement of the new scheme as July 1, 1957. The Commission announced on July 1 that the new maximum charges were to be increased by 10 per cent. as from August 1. This increase was stated to be due to the increases in the cost of coal, wages, steel, road fuel and tyres.

Road Transport Charges

British Road Services and the independent road hauliers increased their charges on May 20, 1957, by 7½ per cent. and 6 per cent. respectively.

Research and Development

The JIC has continued to be the main source of industrial income for the British Cast Iron Research Association, while substantial grants have been made to the British Iron and Steel Research Association as well as to the Institute of British Foundrymen and the British Standards Institution. The problems associated with the future financing of the BCIRA, while primarily a matter for the council of the association, are also of concern to the industry as a whole. At the same time, the JIC has a responsibility to the industry in respect of the services performed with the aid of its financial contribution. The JIC has, by general consent, relied very largely on the BCIRA and to some extent on the IBF for the technical advice and assistance necessary for the discharge of its responsibilities. It is clear that these demands have increased and will increase further, having regard to the technical nature of much of the legislation, such as the Iron and Steel Foundries Regulations and the Clean Air Act, with which to an increasing extent the industry is being faced. In consequence, the resources of the BCIRA on the development side are being severely taxed at a time when it is having difficulty in maintaining its full complement of staff.

Press and Public Relations

The Council's relations with the Press have been maintained and developed during the period under review. There has been considerable Press publicity for news and articles concerning the industry, some of which will not have escaped the eyes of member-firms.

During 1956 the JIC was associated with the efforts of the FBI to increase the amount of time given to industrial subjects in BBC sound and television broadcasts. During 1957, the work of establishing contacts with both the BBC and ITA has been intensified, although at this stage it is possible to do no more than hope that the industry will figure more prominently in future in broadcasts of a kind which will reflect credit upon it.

Photographic Library

Work continues in building up a photographic library of prints, principally supplied by member-firms and available, with their consent, for use in Press articles or for the purposes of internal JIC and CFA needs. Accessions of photographs, whether of foundries or foundry work and processes, or of castings, are always welcome.

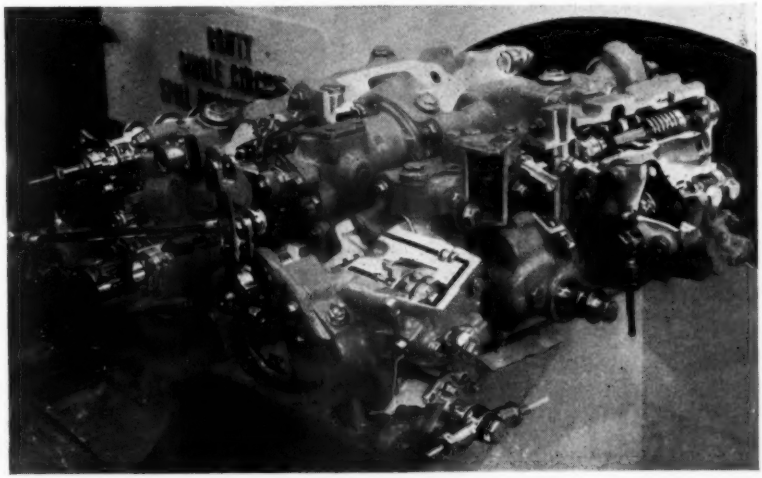
Linking Inventors and Manufacturers

Central sorting house for ideas is planned by the Institute of Patentees and Inventors which is aiming to draw inventors and manufacturers together. Mr. A. W. Richardson, chairman of IPI, told a recent Press conference that emigration of technicians was a great loss that Britain could ill afford.

Mr. R. O. Sutherland, general secretary, said there was a great pool of knowledge, skill, and ingenuity which was awaiting better encouragement from manufacturers. "We want a two-way traffic between inventors and manufacturers. This is essential in the national interest," he said. A great fault was that the inventor had no one in this country to guide him and a high proportion of ideas was wasted.

Excellent Aircraft Castings

More and more, the showing of superlative examples of the founder's art—in light alloys in particular—is becoming to be associated with the exhibitions connected with the annual Farnborough Air Show. From reports reaching the JOURNAL about the show held this autumn, it is clear that castings of even great intricacy and versatility were on view this year, a typical example being the case illustrated below. Founders catering for this class of work and exhibiting it so well deserve the congratulations of the whole of the industry, for they certainly set a very high standard.



Dowty single-circuit "spill burner" fuel-system comprising over 150 castings in seven different materials, viz: DTD 716 and DTD 735 aluminium alloys; DTD 708 magnesium alloy; BS 1631 stainless-steel; S 106 type nitralloy; BS 592 grade B steel, and B 8 phosphor bronze.

Notes from the Branches

East Anglian Section

After last month's successful works visit, the East Anglian section of the London branch of the Institute of British Foundrymen commenced the session's programme of technical meetings on October 15, at the Lecture Hall, Central Library, Ipswich. The retiring president, Mr. H. A. Wincer, was in the chair, and while introducing the new president, Mr. R. E. Berry, he informed the assembly that this year the section celebrated its 21st anniversary. Members were reminded that the success of the section depended upon the support given to it by its members, and that last year's average attendance of one-third of the total membership was very good indeed. The section was also to be congratulated, he said, on its choice of president; Mr. R. E. Berry was well known nationally as well as locally, and had always been a staunch supporter of the section.

Copper-alloy Billet Production

The induction of Mr. R. E. Berry as president was followed by his address, after which he presented a paper entitled "The Story of Copper-alloy Billets." This was an extremely interesting historical review of the development and growth of that side of the foundry industry. After a brief explanation of what a billet is, Mr. Berry took his listeners back to ancient history, mentioning the working of copper as far back as 4,500 B.C. The great advance in about 3,500 B.C. when man discovered how to smelt copper was illustrated by a sketch of the method used. The history of the introduction of alloys was next outlined, and this was followed by the story of the advances made throughout the years of the manufacture of billets and their subsequent working. A big increase in the demand for billets, Mr. Berry said, came with the introduction of stamping and pressing in the 18th century, but probably the biggest demand of all came with the invention, in 1894, of the extrusion process. Nowadays, 90 per cent. of the billets produced are made for extrusion.

Advances in melting and casting techniques were taking place at the same time as the developments outlined, and a series of slides was shown which illustrated these advances. Mr. Berry brought his paper to a close with a review of the most up-to-date of melting and casting techniques. After a discussion, a vote of thanks by Mr. Bolton concluded a very successful evening.

Dinner and Social Evening

On Friday, October 25, members and friends of the East Anglian section foregathered at the Oriental Cafe, Ipswich, for the annual dinner and social evening. A telegram from the national president of the Institute (Mr. J. Blakiston) was read, in which he expressed regret at not being present but wished the section an enjoyable evening.

After dinner, the toast "The Institute of British Foundrymen" was proposed by the section vice-president, Mr. Whipp, who coupled it with the name of the London branch. The response was amusingly and ably made by Mr. A. Talbot, London branch president. Mr. A. R. Parkes, London branch secretary, proposed the toast of the "East Anglian section" and the response in this case was made by the section president, Mr. R. E. Berry. The entertainment came mainly from the "Marmets" concert party, but at one stage they were supported by Mr. Talbot, who was in fine form.

A vote of thanks to Mr. Child, who had organized the function, and to the artistes was made by Mr. F. Baselow, who reminded everyone of the hard work and preparation needed before such an event could take place, and which was so often taken for granted. This brought to a close the offical programme for the evening.

New Patents

(Copies of complete specifications are obtainable from the Patent Office, Sales Branch, 25, Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d.)

780,958. N. C. Ashton, Limited, St. Andrew's Road, Huddersfield, Yorks.

Improved copper/aluminium alloy. A typical composition would be, aluminium 5.5 to 8, cobalt 1 to 2, and iron 0.5 to 2 per cent. The remainder is copper and usual impurities. Any iron above 0.75 per cent. is replaceable by an equal weight of manganese.

781,116. British Oxygen Company, Limited, Bridgewater House, Cleveland Row, St. James's, London, S.W.1.

Process and apparatus for the treatment of fumes arising during steelmaking operations. The invention deals specifically with the treatment of the brown fumes arising when molten metal is treated with oxygen such as, for example, the blowing of oxygen into blast-furnace metal in a ladle.

781,147. R. L. Newby, 47, Lincoln's Inn Fields, London, W.C.2, communicated to him by Dodge Steel Company, 6501 Tacony Street, Philadelphia, 45, Penns., USA.

Improvements in core-blowing apparatus. The principal object of this invention is to provide a simple and effective device for preparing or setting up the apparatus for blowing cores of different sizes and shapes.

781,251. Emery Imre Valyi, 4601 Hendrik Hudson Parkway, Bronx, N.Y., USA.

Apparatus for making foundry shell moulds from a granular moulding mixture consisting of refractory and a bonding agent.

781,254. General Motors Corporation, Grand Boulevard, Detroit, Michigan, USA.

The manufacture of engine cylinder-block castings and the manufacture of water-jacket cores for the cylinder blocks of internal-combustion engines. The method described enables the cylinder-bore diameter of the engine to be increased without increasing the length of the cylinder block.

781,276 and **781,277.** Stewarts and Lloyds, Limited, 41, Oswald Street, Glasgow, C.1.

Both these patents refer to the shielding of molten metal from the ambient air, by an inert gas in the passage of the metal from the ladle into the mould. Access is also available to the ladle outlet as and when required between the mould in top pouring or between the usual trumpet in bottom pouring for the purpose of cleaning the outlet.

781,307. E. R. King, Meaford, Ontario, Canada.

A portable sand-blasting device, the objects of which are to have a self-contained unit, providing for the ejection of the sand out of a container through a nozzle mainly by positive air pressure.

Acoustics Laboratory

Keith Blackman instal Comprehensive Testing Facilities in London

Claimed to be almost unique in this country—if one excepts installations at the National Physical Laboratory—an acoustics laboratory has been built by Keith Blackman, Limited, fan engineers (and ironfounders), on the same site as their works at Mill Mead Road, North London.

Constructional Details

The laboratory, views of which are shown in Figs. 1 and 2, comprises two brick buildings, one inside the other, with a 4- to 6-in. air space between. The outer shell is of 14-in. and the inner of 9-in. brickwork. The complete structure rests on a concrete foundation laid on a cork raft 2-in. thick. The roof is also of double construction, both inner and outer sections being formed of precast concrete slabs with, in this instance, a 9-in. air space between. These air spaces are used for ventilation purposes. Supported from the inner walls and ceiling and leaving a further 3-in. airspace, is a timber framework to which is fitted sound-absorbing slabs, 3-in. thick, of mineral wool, which reduce reverberation time to a minimum.

Entrance to the soundproof chamber is by double doors which form an airlock. The doors are steel-framed with heavy timber inner-frames and are lined with sound-absorbing pads, while the joints between timber, steel and brickwork are sealed with a compound which eliminates the ingress of sound. Door-edges are fitted with Sorbo-rubber sealing strips to ensure complete closure.

The machine base (Fig. 3) on which equipment for testing is positioned, is a solid concrete block measuring 10 ft. by 5 ft. by 2 ft. 6 in. deep, resting on a cork mat 2-in. thick. It is surrounded on the four sides by a 2-in. air-space and covered by insulating pads. The base is set in a pit in the laboratory's cork-covered floor.

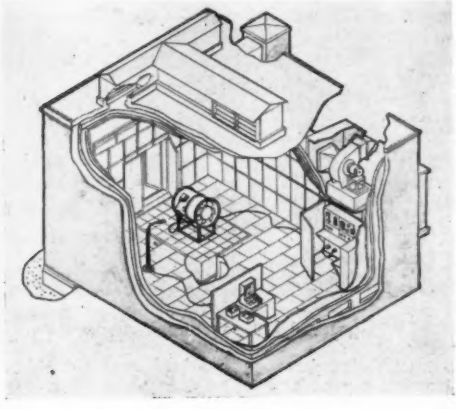
Ventilation of the laboratory is provided by a No. 24, type-EK centrifugal fan, driven by a d.c. motor which permits wide variation in fan speed, and therefore air volume. to be obtained. The fan is situated in a brick-built housing, isolated from the laboratory. Air ducts are lined with "acoustic" felt which, together with flexible connections, prevent transmission of even the slightest air noise.

As the volumetric capacity of the chamber is large, ventilation in the generally accepted sense is not necessary, particularly as, under normal circumstances, only two technicians are working inside. However, the elaborate insulation precautions taken to eliminate and absorb noise does make the chamber, in effect, an ideal "oven" insulated against heat exchange in either direction. Thus, it has to be borne in mind that the whole of the power input to machines under test is dissipated in heat within the chamber. If, for instance, a unit is being tested which is of the maximum power for which the chamber is designed, *i.e.*, 25 b.h.p., then the heat input is equivalent to the switching on of 25 1,000-w. fires. Under such conditions, and assuming no ventilation, within an hour (a relatively short time in which to carry out a thorough test), the air temperature could rise high enough to bake oil-sand cores. The ventilation scheme, however, permits the control of air supply and exhaust in such a way that the temperature under circumstances given in the example quoted, cannot rise above 18 deg. F. beyond the outside air temperature. The volume of air introduced into the chamber to maintain these conditions would be approximately 4,500 cub. ft. per min. Though the laboratory is not fitted with a system to heat the ventilating-air supply, it is provided with independent radiant-convection heaters, the purpose of which is to give a reasonable standard of comfort for the technicians—on Monday-mornings in winter for instance.

Internal Facilities

A very important provision inside the laboratory is the availability of a wide variety of electrical-supply systems designed to cover virtually any demand up to a rating of about 25 h.p. These services cover: 200/250-v., single-phase, 50 cycles a.c.; 180- up to 346-v., single-phase, 60 cycles a.c.; 400/440-v., three-phase,

FIGS. 1 AND 2.—*Exterior view and sketch showing the construction and interior of Keith Blackman, Limited's new acoustics laboratory at their North London works.*



Acoustics Laboratory

50 cycles a.c.; 300- up to 600-v., three-phase, 60 cycles a.c.; and 110-, 220- and 440-v. d.c.

The sectional diagram, Fig. 2, gives a general indication of the construction and interior of the laboratory, which is already very well equipped with instruments of the latest type. Of particular interest is the audio-frequency spectrum recorder, formed by a spectrometer for both manual and automatic measurement of acoustical spectrograms, and a level recorder. This is equipped with 27 fixed, one-third-octave filters for the standardized main frequencies and a low-noise amplifier with a connection for a condenser microphone. The level recorder is a high-speed recording instrument designed for the measurement of reverberation time, sound level and the frequency response of microphones and loudspeakers. It has a 10-speed gearbox and, like the remaining equipment, an accuracy

FIG. 3.—*One of Keith Blackman's "Tornado" range of fans under test in the new laboratory; observe the microphone positioned 5-ft. from the machine and the various insulation features of the chamber's interior furnishing. Sound-absorbing moveable screens prevent the operators and instruments from setting up echoes.*

greater than ±2 per cent. The condenser microphone used in conjunction with the unit has been specially designed for measurement and calibration applications and features very high stability, a high linear frequency response and small dimensions.

There is also a modern sound-level meter comprising a sensitive, non-directional microphone, an amplifier of variable gain and a rectifier-type indicator meter. The gain is adjustable in nine steps of 10 db, the meter being calibrated over a range of 16 db. Three frequency-curves are available, weighted for 40 db, 70 db, and flat equal-loudness contours. The meter response is normally very rapid, the ballistic characteristic being similar to the human ear, but heavy damping can be applied to give the average level of fluctuating sounds.

For use with this meter there is an analyser for measuring the relative amplitude of the component frequencies in a sound wave. The logarithmic circuit of the indicating meter allows a range slightly in excess of 40 decibels (or 100 to 1) to be read. The scale is calibrated in decibels and per cent. amplitude.

Strobo-Flash instruments for general observation and speed indication are provided and, of course, mechanical speed indicators with all necessary instrumentation for the taking of air-volume and pressure readings, and electrical instruments for power measurement.

British Standards Required

The problems involved in sound investigation and testing are many and complex. One of the most serious is the fact that no standard code for the measurement of sound particularly applicable to fans has been universally accepted. Consequently figures variously quoted on sound levels are of little value for comparison purposes unless full information is available on the conditions under which they were obtained, and the methods of measurement fully described.

It is considered the firm now has the facilities which provide conditions in which comparisons can be made. In the absence of any authentic British specification, the positioning of microphones, etc., is based generally on the recommendations embodied in the "Sound Measurement Test Code for Centrifugal and Axial Fans" as published and adopted in 1952 by the American National Association of Fan Manufacturers. This means that for most sound testing, the microphone is arranged 5 ft. from the machine.

The underlying thought in providing these facilities is to further research and development on this subject of noise prevention or suppression. By so doing the firm also hopes still further to improve the present high standard of its fan engineering equipment.

Keith Blackman Limited are well known to readers of this JOURNAL, they claim to manufacture the world's widest range of fan-engineering equipment; products include centrifugal fans up to 180-in. diameter, turboblowers for pressures up to 7 lb. per sq. in., axial and propeller fans, air-heater batteries for industrial processes, space heaters, air filters and washers, fume-removal units and dust-exhausting and -collecting units. The present company is the result of an amalgamation in 1890 between the Blackman Ventilating Company Limited (which was founded in 1883 for the manufacture of an air-propeller fan) and James Keith (a business concerned with the manufacture of hot-water boilers and industrial-gas apparatus which originated in Arbroath, Scotland, in the year 1823). The principal works and head office are now at Tottenham, North London. Additional works and foundries are in Arbroath and there is a sheet-metal works at Edmonton, North London. The total number of personnel employed exceeds 1,900.

Not only have Keith Blackman provided themselves with this very useful laboratory for testing and checking their own products, but the equipment is also offered to other firms for use on a contract or day-to-day basis. While it is too much to hope that makers of foundry equipment, generally, will ever be able to emulate in their manufactures the quietness of a fan, yet it is gratifying to note that they can use this laboratory for finding out just how much noise any one machine makes. The writer considers it almost certain that founders will soon have to take noise production from foundry equipment very seriously into consideration, at least when planning new schemes, and this is considered ample justification for reporting fully on Keith Blackman's latest enterprise.

Four American Conferences

Comprehensive Range of Material Presented

A number of papers of major interest to foundrymen were presented at four conferences devoted to the foundry trade which have been held in the USA during the past two months. The occasions referred to are the Michigan, New England and Niagara Frontier Regional Foundry conferences held respectively at East Lancing, Michigan (October 2-3), Cambridge, Massachusetts (October 18-19), and Buffalo (October 24-25), and the annual Metals Castings Conference at West Lafayette, Indiana, on October 31-November 1. In what follows, titles are given of some 46 papers, together with brief notes of the conferences to which they pertained.

Michigan Region

The 1957 annual Michigan Regional Foundry Conference was held at Kellogg Centre, Michigan State University, East Lancing. The following papers were presented:—" Cores—CO_2 Process " by Mr. C. Meyer, Central Foundry Division, GMC; " Gasified Process "; " Core Shooting " by Mr. R. Greenlee, Auto Specialties Manufacturing Company; " Creative Management " by Dr. H. Sylvester, Michigan State University; " Progress in Foundry Training " by Mr. H. W. Dietert, Harry W. Dietert Company; " Preventive Maintenance —Air " by Mr. M. L. Williamson, Chevrolet-Saginaw Gray Iron Foundry Division, GMC; " Belting " by Mr. James Stewart, Chrysler Corporation; " Bearings: Electrical Equipment "; " Quality Control-Scrap Reduction—Non-ferrous " by Mr. R. Cope, Rapid Cast Corporation; " Steel " by Mr. W. T. Shute, West Michigan Steel Foundry Company; " Grey and Malleable Iron " by Mr. E. C. Bumke, Campbell-Wyant-Cannon Foundry Company; " Gamma Radiography " by Mr. D. M. Murray, Albion Malleable Iron Company; " Shell Moulding Developments at Ford Motor Company " by Mr. H. C. Grant.

New England

The New England Regional Foundry Conference took place on October 18-19 at the Massachusetts Institute of Technology, Cambridge, Mass., and included four ferrous and two non-ferrous sessions at each of which two papers were presented.

During the sessions devoted to ferrous subjects papers presented were:—" Epoxy Resin " by Mr. M. K. Young, United States Gypsum Company; " Which Core Process? " by Mr. Anton Dorfmueller, Jr., of Archer-Daniels-Midland Company; " How to Use Foundry Manpower Effectively "—a panel discussion by Mr. H. M. Palmer, of Lewis-Shephard Products Inc., and Mr. John F. Bertuccio, of J. C. Corrigan Company; " Metal Injection " by Mr. William Lysobey, of Air Reduction Company.

In non-ferrous sessions the following papers were presented:—" Design for Quality " by Mr. R. Colton, of the American Smelting and Refining Company; " Oil Bonded Moulding Sands " by Mr. R. A. Megaw, National Lead Company; " Practical Mechanization for the Small Foundry " by Mr. R. T. Koehler, Hamilton Brass and Aluminium Castings Company; " Treatment of Non-ferrous Metals " by Mr. R. Ruddle, Foundry Services Inc.

On more general topics were:—" Future Prospects for New England Foundries " by Professor Howard F. Taylor, Michigan Institute, and Professor C. Reynolds, Dartmouth College; " Are You Giving Your Customer What He Really Needs? " by R. C. Meloy, Grey Iron Founders' Society; and " Managing a Foundry Professionally " by Glenn C. Cooke, General Electric Company.

Niagara Frontier

The Niagara Frontier Foundry Conference took place on October 24-25 at the Statler Hotel, Buffalo, and comprised separate sessions on malleable, non-ferrous grey-iron, steel, stainless-steel and pattern-making subjects. The 15 papers presented were:— " Present Status and Prospects for the Foundry Industry " by Mr. W. G. Gude, managing director of the American periodical *Foundry;* " Safety " by Mr. W. H. Bleakley, Abco Inc.; and at sectional meetings the following material was included:—

Malleable Iron: " Fundamentals of Sand Control " by Mr. E. E. Woodliff; " Stress Analysis Improves Casting Design " by Mr. R. Gilmore, Superior Steel and Malleable Castings Company; *Non-ferrous:* " Metal/Mould Reactions in Bronze Alloys," by Mr. R. B. Fisher, Ingersoll-Rand Company; " Gas and its Control in Aluminium Castings " by Mr. D. La Velle, Kaiser Aluminium and Chemical Inc.; *Grey Iron:* " Development of Pacumatic Sand Reclamation Equipment " by Mr. C. Wenninger, Pettibone, Mulliken Corporation; " General Cupola Practice " by Mr. W. Adams, International Minerals and Chemical Corporation; " Which Core Process? " by Mr. A. Dorfmueller Jr., Archer-Daniels-Midland Company.

Steel: " Steel Castings to Compete with other Materials " by Mr. C. B. Jenni, General Steel Castings Corporation; " Russian Foundry Practice " by Mr. A. J. Kiesler, General Electric Corporation; " Core and Moulding Sand Additions " by Mr. J. A. Gitzen, Delta Oil Products Company; *Stainless Steel:* " Production Problems Encountered in Making Stainless Steel Castings " by Mr. A. E. Schoefer, Alloy Casting Institute; " Melting Stainless Steel " by Mr. L. Coshdollar, Pittsburgh Metallurgical Company; *Patterns:* "Pattern Engineering " by Mr. R. Olson, Southern Precision Pattern Works; " Latest Developments in the Pattern Industry " by Mr. W. Siebert, Standard Pattern Works.

Metals Casting Conference

The annual Metals Casting Conference was held at Purdue University, West Lafayette, Indiana, on October 31-November 1 and included four technical sessions at which the following papers were presented:—" What We Expect from Our Vendors " by Mr. J. Miller, Cummins Engine Company; " Practical Scrap Reduction " by Mr. H. Felton, Peoria Malleable Castings Company; " Diaphragm Moulding " by Mr. W. Cheek; " Stack Moulding "; " Joint Squeeze Moulding " by Mr. C. H. Lambert, Eastern Malleable Iron Company; " Sandslinger " by Mr. W. E. Patterson, Elkhart Foundry and Machine Company; " Hot Blast and Moisture Control " by Mr. C. F. Joseph, Central Foundry Division, GMC; " Hot-tearing " by Mr. R. W. Heine, University of Wisconsin; " Human Engineering " by Mr. H. Heinrichs, Chicago Institute of Human Science; and finally, " Ductile Iron," after which there was a conference summary.

Whilst the topics listed above are not exhaustive, they do show the enormous coverage of these regional foundry conferences in America. The Michigan conference was sponsored by Michigan Chapters of the American Foundrymen's Society, the New England gathering was under the sponsorship of New England and Connecticut Chapters of the A.F.S., while the Niagara Frontier conference was sponsored by a number of New York, Pennsylvania and Canadian AFS Chapters. The Purdue Metals Castings conference was also under the sponsorship of Regional AFS Chapters.

British and World Shipbuilding

Lloyd's Returns for September Quarter

For foundries whose production "rides the tonnage waves" of ship construction, Lloyd's Register for the third quarter of 1957 shows:

Country.	Launched.		Completed.		Under construction.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
Great Britain ..	66	358,500	61	285,000	339	2,240,000
Japan	119	635,000	102	628,000	209	1,480,000
Germany ..	119	328,000	—	—	234	827,000
Sweden	17	120,000	22	144,000		
Holland	46	89,000	57	145,000		
France	12	100,000	16	56,000		
United States ..	12	87,000	11	62,000		

During the period under consideration, in Japan work was started on 118 ships of 628,985 tons, while Britain commenced 74 of 456,318 tons. This country has the greatest number of ships under construction, with 23.96 per cent. of the world's total.

Steamships and motorships under construction in Great Britain and Northern Ireland at the end of September totalled 339 ships of 2,240,731 tons gross, an increase of 179,968 tons compared with the previous quarter. The vessels included 76 steamships of 1,085,421 tons and 260 motorships of 1,154,842 tons. In other British Commonwealth countries there were under construction 11 steamships of 43,666 tons and 47 motorships of 118,942 tons. Oil tankers building in Great Britain and Northern Ireland totalled 75 ships of 1,004,708 tons, an increase of 75,623 tons compared with the previous quarter. The tanker figure represents 44.8 per cent. of the total tonnage under construction in this country. Vessels building in the world numbered 1,737 of 9,350,553 tons (including five wooden ships of 748 tons), compared with 1,691 of 8,778,635 tons in the previous quarter. The total included 321 steamers of 4,075,485 tons and 1,411 motorships of 5,274,320 tons. Construction in hand in the principal districts of Great Britain and Northern Ireland is indicated in Table I.

The sizes of steamships and motorships (in parentheses) under construction in Great Britain and Northern Ireland included the following:—100 to 1,000 tons, 12 steam (93 motor); 1,000 to 2,000 tons, 2 steam (30); 2,000 to 4,000 tons, no steam (19); 4,000 to 6,000 tons, 2 steam (18); 6,000 to 8,000 tons, 3 steam (35); 8,000 to 10,000 tons, 7 steam (38); 10,000 to 15,000 tons, 18 steam (28); 15,000 to 20,000 tons, 5 steam (1); 20,000 to 25,000 tons, 18 steam (1); 25,000 to 30,000 tons, 6 steam (nil); 30,000 tons upwards, 3 steam (nil).

TABLE I.—*Shipbuilding Construction in Hand in Principal Districts of Great Britain and Northern Ireland.*

District.	September 30, 1957.		June 30, 1957.		September 30, 1956.	
	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.
Aberdeen ..	18	23,142	18	26,584	18	20,935
Barrow ..	4	108,770	3	68,770	4	93,070
Belfast ..	19	291,339	19	248,973	18	210,050
Bristol ..	3	2,160	4	1,845	4	2,666
Clyde—						
Glasgow ..	74	448,854	69	437,459	76	447,993
Greenock ..	30	202,308	27	177,420	29	184,421
Dundee ..	6	38,700	6	38,700	5	36,210
Hartlepool ..	7	54,600	7	56,900	7	49,590
Hull	36	18,884	33	17,017	34	19,483
Leith	11	47,820	11	54,400	11	53,160
Liverpool ..	15	161,340	15	128,623	19	156,414
Middlesbrough	16	208,633	14	163,918	14	177,300
Newcastle-upon-Tyne ..	40	401,720	39	409,590	36	393,251
Southampton ..	6	4,000	5	3,800	4	3,570
Sunderland ..	27	199,249	28	207,197	29	217,406

European Mechanical Handling Federation

A meeting of section IX of the *Federation Européene de la Manutention* (European Mechanical Handling Federation), dealing with light lifting apparatus, was held in Vienna on October 9 to 10, on the occasion of the fifth European Congress of the Federation. At the meeting a special committee, consisting of representatives from France, Germany, Great Britain and Sweden, was appointed with the object of devising a standard on diameters of drums and reels in relation to diameters of cables and ropes. In order to preserve continuity it was decided that the present office bearers should be re-elected, but in view of the important influence of British manufacturers in this field of work it was considered essential that a British delegate should be introduced into the bureau of the section, the composition of which is now as follows:—Mr. H. Huber, chairman (Switzerland), with Mr. F. Stein (Germany), Mr. M. Verlinde (France), and Mr. L. J. Tichelly (Great Britain) as vice-chairmen.

Iron-ore Imports

Iron-ore imports in September, and the totals for the first nine months of this year and last, are shown below.

From	Month ended Sept. 30.	Nine months ended September 30.	
	1957.	1956.	1957.
	Tons.	Tons.	Tons.
Sierra Leone	35,795	499,209	541,328
Canada	438,882	1,810,874	2,190,779
Other Commonwealth countries and Eire	—	12,137	13,682
Sweden	344,186	3,266,794	3,030,223
Norway	23,296	64,493	190,626
Western Germany	9	3,100	26
France	68,689	478,625	486,162
Portugal	14,638	90,069	107,455
Spain	99,070	648,186	851,884
Algeria	106,996	1,135,003	1,116,004
French West Africa	48,960	450,586	491,049
Tunisia	41,775	595,274	521,045
Northern Morocco	12,700	204,098	184,030
Southern Morocco	37,760	287,600	292,230
Liberia	24,590	247,641	278,048
Brazil	79,479	406,192	544,127
Other foreign countries	79,234	536,627	892,681
TOTAL	1,454,059	10,736,508	11,731,379

A NEW COMPANY PENSION SCHEME to operate from next April is to be introduced by the Steel Company of Wales, Limited. The scheme provides life assurance cover and an addition to the national pension to assure greater security in old age. Provision will be made by additional contributions from the company for benefits in respect of past service. The company will continue to pay gratuities to long-service employees who leave before the commencement of the scheme, while those eligible and who become redundant by the closing down of the old-type tinplate works will receive benefits from the Tinplate Trade Redundancy Fund.

Corner Scale in Ingot Moulds

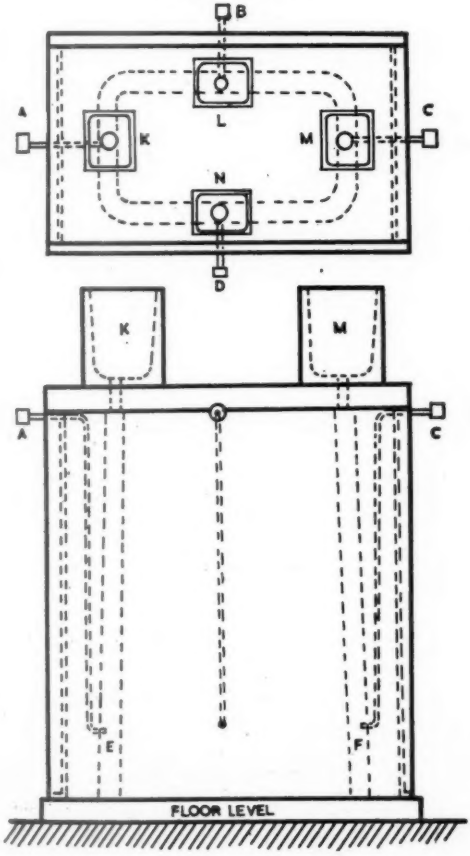
Further Refinements in the Process for its Elimination

In an article printed in this JOURNAL, September 5, 1957, p. 294, it was reported that large ingot moulds may "bleed" during the solidification of the iron, the resulting hard deposit of high-phosphorus iron forming what is generally known as "corner scale." It was shown how blowing air into the sand mould during the solidification period could materially help in avoiding this nuisance.

Since that time some further experience has been gained and it has been found that even more effective prevention can be obtained if the air is injected at one or more points in the bottom part of the mould rather than the top.

These points should not be immediately underneath but a little to one side of those parts of a mould where it is known segregated high-phosphorus iron would be pooled. Thus, the air in rising to the surface will induce a circulation of iron in the vicinity of the pools which will break them up and carry the constituent iron to points near the feeder heads where it will be comparatively innocuous. If the points of entry were placed in such positions as would cause the air to rise through the pools, the track of the rising air would be heated and the condition which it is expressly designed to avoid would be perpetuated. The process of mechanical displacement is thus complementary to the natural process of segregation and the whole mass of iron in the mould will be affected thereby.

FIG. 1.—*Set-up for deep-blowing during production of ingot moulds.*



In cylindrical moulds the segregation of phosphorus-rich iron can be localized by making the core of the mould eccentric to its outer face, but in rectangular moulds, as shown in Fig. 1, the air is controlled by the valves, A, B, C and D on the injection pipes and is passed into the mould at points E and F on the one side and points similarly placed on the other. As before stated, these should be near the corner of the mould. In each case the air passes through the metal to feeder heads K, L, M, and N, and then to the atmosphere, leaving the phosphorus-rich iron at those points. As before, the total period during which the air shall be applied is related to the weight of the mould.

Moulding Procedure

When making the sand mould the air tubes are rammed in position in the sand walls of the mould, with the ends bearing against the pattern and encased in a ball of refractory material which reduces the erosion of the sand wall by the incoming air and also serves the purpose of marking the position of the tube when preparing the mould for casting. A small extension pipe is screwed into the bottom end of the air pipes which ensures that the air is blown directly into the mould metal. This extension pipe will ultimately be absorbed by the molten metal but the air will continue to flow through the refractory material.

After processing the metal in this way its composition is more uniform throughout and its shrinkage characteristics are also more uniform. Stresses are thus largely removed. Another feature is the breaking-up of scruff plates as they form on the surface of the molten metal as it rises in the sand mould during casting.

The physical disturbance in the mass of the iron throughout its depth, as described here, acts in conjunction with the natural segregation of high-phosphorus iron in the mould and effects a more complete elimination of the phosphoric alloy which is the cause of corner scale. This later modification of the original process has also been covered by provisional patent.

Swedish Iron and Steel Production

Swedish iron and steel production in the second quarter of 1957, in metric tons, included:—Pig-iron, 371,100 *tonnes*; sponge iron, 35,300 *tonnes*; ingots, 638,500 *tonnes*; finished steel castings, 9,000 *tonnes*; billets, blooms, and slabs, 422,200 *tonnes*; and finished steel products, 435,100 *tonnes*.

New Catalogues

Vacuum Melting Furnaces. Wild-Barfield Electric Furnaces, Limited, Elecfurn Works, Otterspool, Watford By-pass, Watford, have issued a simple leaflet to describe the resistance-heated vacuum furnace—model 2904—which was originally designed by the National Research Corporation of Massachusetts and is now being made at Watford. In the early stages, it was largely used for the laboratory work in connection with the metallurgy of titanium. Though perhaps research departments are still its main outlet, no fewer than 70 have been supplied, and it is now finding its way into commercial applications. The model described melts 8 lb. of steel, when used as a non-tilting unit, and 2 lb. when employed as a tilter. The leaflet discloses that the equipment, suitable for operating up to 2,000 deg. C., has close temperature control, and there is no contamination from refractories.

Unit Dust Collectors. Two models of dust-collecting units—differing only as to capacity—are described and illustrated in an attractive 14-page brochure issued by A. E. Griffiths (Smethwick), Limited, Booth Street, Handsworth, Birmiingham, 21. The models have been designated Micronette and Micromaster and are used to collect dust at the source of its production. The system used is to separate the dust particles from the air by filtration, where they are collected in a removable tray, the filtered air being discharged from the unit. An increase in volume of air at the base of the unit causes a sudden decrease in its velocity, so causing primary separation of the dust. The air then rises and passes through textile filtering sleeves thereby retaining a high percentage of the remaining dust.

Pressure-cast Patternplates. G. Perry & Sons, Limited, Hall Lane, Aylestone, Leicester, have issued an illustrated folder covering various types of pressure-cast patternplates. It indicates that as a prelude to designing a plate, the firm issue a form to be filled in, with sketches, by the buyer as an aid to co-operation, which after all is the basis of success for the supply—not only of patternplates, but any type of pattern. The front page of the folder carries an illustration of a head-and-shoulders casting, which being of somewhat grotesque nature, does not appeal to the reviewer, but this is a purely personal prejudice.

Ventilated Hand-wire-brush Cowl. The Dustuctor Company, Limited, Hayle, Cornwall, have prepared a leaflet which describes and illustrates the practical application of the system of high velocity low-volume exhaust when using wire brushes for fettling. An example is shown of the device adapted for use with a Canning coarse, flat-wire hand-brush. To prevent the escape of dust from between the wires, an easily replaceable fringe of nylon bristle is incorporated. The cowl is attached to the brush by four screws. Acquisition of this pamphlet is strongly recommended to readers.

Ventilation. Air Control Installations, Limited, Ruislip, Middlesex, have issued no fewer than eight new publications. Such a quantity is too much to review at one "sitting" so that a list of titles only can be quoted, *viz.* "Better Air: Fans"; "Roll-O-Matic" (an automatic renewable-media air-filter); "Amer-Clone" (dry, centrifugal dust collector); "Amerjet" (fabric dust-arrester); "Electro Mist" (a precipitator for oil mist and fume collection); "Cycoil Type P" (for oil-bath use); and finally "Design of Rotoclone Dust-control Systems."

Mechanical Handling. A 12-page catalogue received from G. Hunter (London), Limited, 80, Fenchurch Street, London, E.C.3, describes a wide range of hand- and electrically-operated stacking machines. Most of the models shown are of the wheelbarrow-type to be used as simple fork-lift trucks; others use power taken from the electricity mains. All the trucks carry the trade name of Jacacaddy.

Publications Received

Investigation of Atmospheric Pollution—A report for the year ended March 31, 1955. Published by Her Majesty's Stationery Office for the Department of Scientific and Industrial Research, York House, Kingsway, London, W.C.2; price 5s. 6d. post free.

This 150-page brochure is in the main of a statistical nature. Readings have been taken at many hundreds of points in Great Britain, and the total amount of matter deposited from the atmosphere has been calculated for the year and the figures are variously subdivided. It is possible to see, for example, that the deposited matter in the best parts of Sheffield is lower than the worst area in Kingston-on-Thames. The average deposits reported are much the same as those for the previous five years. Steel reheating furnaces have been subjected to tests at Sheffield University and it is stated that as a result smoke production need no longer be regarded as inseparable from this operation.

Platinum Metals Review, Vol. 1, No. 4. Published by Johnson, Matthey & Company, Limited, Hatton Garden, London, E.C.1.

The first article in this issue covers "Liquid-steel Temperature Measurement." The authors, Mr. W. C. Heselwood and Mr. D. Manterfield, remind readers that it was in 1917 that the late Dr. Hatfield stated there was no ready and reliable method of measuring the temperature of liquid steel and that it was 20 years later before the problem was solved. Now, not only are pyrometers readily available, but their use has been made easy by the incorporation of mechanical devices for their manipulation. Moreover, the results they have yielded are of great practical value to the steel industry.

Standard and Pearlitic Malleable-iron Castings. Issued by the Malleable Founders' Society, 1800 Union Commerce Building, Cleveland, 14, Ohio, USA.

This eight-page publication has an interesting layout. It consists of a series of claims—such as with regard to accuracy or machinability—and the substantiation of each claim is illustrated by a component or a series of components. Nearly two pages are devoted to specifications, and, it is interesting to note, whilst there are but two grades for standard malleable, there are about ten for the pearlitic type.

List of Publications. Issued by the Aluminium Development Association, 33, Grosvenor Street, London, W.1.

This is a very useful booklet to have by one, as it provides sources of information as to the potentialities of aluminium alloys in industry. Moreover, the information is contained within the small compass of 32 pages and yet it is comprehensive. Some of the documents listed are available on loan, many are free, whilst the rest cost but a couple of shillings or so.

Company News

BAKER PERKINS, LIMITED, manufacturing engineers and founders, of Peterborough—The interim dividend is 2½ per cent., compared with 1¼ per cent. last year. The increase is made to reduce disparity between the interim and final dividends, and should not be taken to imply an increase in the total payment for the year.

JOHN THOMPSON, LIMITED (formerly John Thompson Engineering Company, Limited)—The company reports that approximate figures of the various group companies indicate that the total gross profit, before depreciation, taxation, etc., for the first half of 1957 is well maintained compared with the figure for the corresponding period of last year.

WOLVERHAMPTON DIE CASTING COMPANY, LIMITED—Group profits contracted from £146,229 to £102,518 in the year to June 30, 1957, and the dividend on the £225,000 ordinary capital is reduced from 40 per cent. to 25 per cent., with a final of 15 per cent. against 20 per cent. After taxation of £47,329, against £63,660, net profit is down to £55,189 from £82,569.

MIDLAND ALUMINIUM, LIMITED—The company announces a 3 per cent. dividend for the year ended June 30, 1957, against 9 per cent. previously. When the interim was passed, the board stated there would be a substantial reduction in group profits, which are now shown to be down from £164,603 to £91,568. Tax takes £31,818 (£70,410), leaving a group net profit of £25,063, against £34,199.

LE GRAND, SUTCLIFF & GELL, LIMITED, oilfield equipment manufacturers, etc., of Southall (Middx)—The offer by Platt Bros. & Company (Holdings), Limited, textile machinery manufacturers, of Oldham, to acquire the balance of the 5s. ordinary shares is recommended by the board. The offer is conditional upon acceptance by November 22 or an extended date not more than 21 days later.

JOHN DALE, LIMITED, collapsible-tube manufacturers and founders, of London, N.11—The new 5s. ordinary shares to be issued by the company have been priced at 11s. 6d. Philip Hill Higginson & Company, Limited, London, E.C.2, announces that arrangements have been completed for the underwriting of 500,000 shares. Provisional allotment letters and application forms have been posted and dealings started last Thursday.

MCKECHNIE BROS., LIMITED, non-ferrous metal manufacturers, etc., of Birmingham—Group profits fell sharply from £1,052,162 to £393,823 in the year ended July. 31, 1957. Net profit after tax was £133,843 (£525,132). No change is made in the dividend, with a 10 per cent. final again making 15 per cent. for the year on the ordinary and "A" ordinary capital. In September, 1956, there was also a special distribution of 2½ per cent. out of non-taxable profits.

GAS PURIFICATION & CHEMICAL COMPANY, LIMITED—Cost of developing new products and bringing them into quantity production has been greater than was anticipated, state the directors in a preliminary survey of the accounts for the 15 months ended June 30, 1957. This feature is non-recurring and benefits should soon begin to accrue, but in the meantime, the immediate consequences must have an effect upon dividend policy which was not apparent when the interim declaration of 20 per cent. was made in March.

JOHN I. THORNYCROFT & COMPANY, LIMITED, engineers, shipbuilders, etc., of London, S.W.1—There are sufficient orders to keep all labour available at Southampton port busy during the current year, states the chairman, Sir John Thornycroft, who goes on to say that the introduction of new capital or bank borrowing with a 7 per cent. bank rate, must be a serious charge on future trading and he hopes it will not be necessary. The group net profit is £433,443 (£344,751) and the dividend is repeated at 12½ per cent.

STAVELEY COAL & IRON COMPANY, LIMITED—Profit margins of the English operating companies again narrowed in the year to June 30, 1957, but the reduction in profit ratio was made good as a result of expanding turnover. Mr. T. A. McKenna, chairman, emphasizes that profit margins generally are still insufficient in a period of rising prices to meet the increasing costs of the replacement of fixed assets and working capital. Group profits fell from £1,745,886 to £1,598,754 and the dividend is cut from 15 per cent. to 14½ per cent.

SANBRA, LIMITED, sanitary brassfounders, of Birmingham—The formal offer has been made by the Delta Metal Company, Limited, London, S.E.10, for the shares not already owned by it in Sanbra. It is on the basis of one Delta 5s. share plus 10s. cash for every 10 Sanbra ordinary 1s. shares. The company has already declared an interim of 3½ per cent. on ordinary and the directors with the approval of Delta intend, if the offer becomes unconditional, to declare a second interim of 10 per cent. for shareholders registered November 26. This will take the place of a final which would normally be payable in about May, 1958. The shares of Delta issued under the terms of the offer will carry no right to any dividend in respect of 1957. Sanbra's total issued ordinary capital is £364,000. There is also £60,000 in 6 per cent. 10s. preference in issue.

Brightside's Increased Costs

Due to increased overheads, loss of revenue caused by the strike in March, and a reduction in the number of long-term contracts completed during the year to June 30, 1957, group profits, before tax, of the Brightside Engineering Holdings, Limited, group were down by £46,096 at £770,321, according to the chairman, Mr. A. Firth. This was despite an increase in turnover, which rose by 10¾ per cent. The year's dividend is unchanged at 25 per cent.

At the year-end the group held £911,926 in cash and short-term loans, compared with £624,829 12 months earlier, but these resources would be needed. It had been decided to build a new ingot-mould foundry and work has begun on the construction of the buildings. Capital expenditure on this project, which amounted to over £500,000 made up a large proportion of total group commitments.

Referring to the current year, Mr. Firth said that it started with a good order-book and that considerable advantages were now apparent from the decentralization scheme which was now completed. The expansion to the roll department of the Brightside Foundry & Engineering Company, Limited, did not come into operation as early as planned, but the benefits of the outlay should be felt during the current year.

Increases in Capital

WOODHALL-DUCKHAM, LIMITED, London, S.W.3, increased by £900,000, in 5s. ordinary shares, beyond the registered capital of £1,000,000.

CONTINUOUS CASTING COMPANY, LIMITED, London, S.W.1, increased by £19,000, in £1 ordinary shares, beyond the registered capital of £100.

K.G.S. BEARING COMPANY, LIMITED, Wolverhampton, increased by £19,900, in £1 ordinary shares, beyond the registered capital of £100.

SURPLICE & TOZER ENGINEERING COMPANY, LIMITED, London, S.W.1, increased by £10,000, in £1 shares, beyond the registered capital of £2,000.

News in Brief

SHAW MOISTURE METERS have moved to their new factory and laboratories at Rawson Road, Bradford. The head office remains at 31, Market Street, Bradford.

RICHARDSON SCALE COMPANY, LIMITED, announce that the address of their works and office is now Albert Street, Bulwell, Nottingham (telephone: Nottingham 27-8558).

THE ADDRESS of the Ensign Conveyor Company, Limited, a member of the Thos. W. Ward organization, is now Albert Street, Bulwell, Nottingham (telephone: Nottingham 27-1530).

A DONATION of £1,000 has been made by the Dunlop Rubber Company, Limited, to the Production Engineering Research Association's fund for the development of a new workshop and laboratory.

MORE THAN 120 PEOPLE attended the third annual dinner/dance of the design department staff of the Hucknall division of Rolls-Royce, Limited, which was held at the George Hotel, Nottingham.

VISITORS from the Department of Industrial Engineering, of Loughborough College of Technology, recently spent a day at the works of Ericsson Telephones, Limited, of Beeston, near Nottingham.

THE Federation of Light Metal Smelters reports that its members' average selling prices for the month of September, calculated to the nearest 10s., were:—LM1, £152 10s. per ton; LM2, £157; LM4, £180 10s.; LM6, £201.

FOUR FOREIGN CONCERNS have been negotiating with the Central and State (Bombay) Governments on the setting up of a pig-iron plant in the Chanda district of the Vidarbha region of Bombay State. The plant will be conducted on the Government pattern using lower-grade coal.

THE LANARKSHIRE FIRM of William Hunter & Sons, ironfounders, Clydesdale Foundry, Wishaw, has been dissolved following the retirement of Mr. James A. Hunter, one of the partners. The business is being carried on by Mr. William Hunter on his own account under the same name.

Mr. WILLIAM HASTON, a Middlesbrough moulder employed by Head, Wrightson & Company, Limited, Thornaby, was awarded £999 damages at Durham Assizes in respect of an accident, when he hurt a knee when jumping to safety following an eruption of molten steel from a casting.

WILD-BARFIELD ELECTRIC FURNACES, LIMITED, of Watford, Herts, announce that they have been entrusted with the contract for the manufacture and installation of a 600 lb. vacuum induction melting furnace to be installed at William Jessop & Sons, Limited, of Sheffield, for the melting of titanium.

HEAVY RAIN again caused flooding on November 5 at the iron and steel foundry in Clayton Street, Chesterfield, of Robert Hyde & Son, Limited, as well as other local premises. Such flooding is not an unusual occurrence, and six weeks ago 100 of the company's employees were temporarily put out of work because of severe flooding.

PRIMARILY INTENDED to "assist the British steel industry in its development plans with technical advice and the supply of equipment," a new company, Rymag, Limited, has been formed to represent Demag A.G., Duisburg, in the UK. The managing director of the company, whose offices will be at Leadenhall House, London, is Mr. B. Ryman.

AT the apprentices annual prize-giving held by F. H. Lloyd & Company, Limited, Darlaston, Mr. M. C. Lloyd, assistant managing director, told the 350 trainees, and their parents, that he deplored the calling up for military services of young skilled men at the age of 21, now that a reduction in the armed forces was coming into force.

MANUFACTURE OF BERYLLIUM HYDROZIDE at the Milford Haven factory of Murex, Limited, is to be controlled by the Atomic Energy Authority. In 1949 the factory started production under contract from the Ministry of Supply, and in 1954 the agency contract was transferred to the AEA. The authority will take over control on March 31, 1958.

CRICKET was the topic at the luncheon of the Non-Ferrous Club at the Queen's Hotel, Birmingham, on November 6, when the guest speaker was Mr. Norman Yardley, one-time captain of England. Over 70 members and guests attended the luncheon, at which a collection was taken on behalf of the Earl Haig Fund and a sum of £26 4s. 6d. was raised.

KNIGHT ENGINEERING ESTABLISHMENT, Vaduz, Liechtenstein, of the well-known American consulting firm, Lester B. Knight & Associates, Inc., has opened a branch in Zurich, Switzerland. Mr. Nicholas G. Hayek, formerly manager of the Mezger Foundry and Machine Company, is to be manager of the branch with offices at Bahnhofstrasse 17, Zurich.

ELEVEN FULLY-MOBILE GENERATING SETS of 400 kw. and 125 kw. output are being delivered to the Metropolitan Water Board by Blackstone & Company, Limited, Stamford (Lincs). Nine of the sets are of the 400 kw. type. Each of these is capable of handling anything from 10,000 to 20,000 gallons a minute, depending on the lift of the pump.

THE BOARD OF TRADE announce that they intend to dispose of 37 tons of beryllium copper master alloy with a beryllium content of about 4 per cent. This material is being offered for sale by open tender for delivery in December and January. Forms of tender will be obtainable from the Board of Trade, G.7. Lacon House, Theobalds Road, London, W.C.1, in a few days.

UK MACHINE-TOOL ORDERS in August were more than 11 per cent. lower than in August, 1956. Production, however, was 4 per cent. higher. The total outstanding order-book fell for the fourteenth month in succession to £89,200,000, representing 11 months' output at the current rate. In August, 1956, the order-book stood at £104,900,000, equivalent to 15 months' production.

SUBSTANTIAL ORDERS for textile machinery may be placed with British firms following the visits of Chinese experts to factories in Yorkshire, Lancashire, and Leicestershire, including those of Prince-Smith & Stells, Limited, Keighley (Yorks), and Platt Bros. & Company, Limited, Oldham (Lancs). Orders now being negotiated would, if placed in this country, amount to something over £1,000,000.

THE Northern Ireland Development Council announces that one of the new "advance" factories at present under construction on the Carnmoney Estate, near Belfast, is to be occupied by a new subsidiary company of Reliance-Clifton Cables and Industrial Products, Limited, of Leyton, London. The new company will be known as Belfast Cables, Limited, and will be initially equipped to manufacture plastic-covered cables for Great Britain and overseas.

THE DU PONT COMPANY (UNITED KINGDOM), LIMITED, with offices at 5, Charles II Street, London, S.W.1, has been formed to manufacture and sell neoprene in the

United Kingdom and European markets. This company is a wholly owned subsidiary of E. I. Du Pont de Nemours & Company, Inc. With effect from January 1, 1958, sales for neoprene will be made in the name of Du Pont Company (United Kingdom), Limited, and Durham Raw Materials, Limited, will act as sales agents.

CONSTRUCTION MACHINERY, LIMITED, of Thornes Moor Road, Wakefield, an associate of the Wakefield engineering firm of British Jeffrey-Diamond, Limited, have secured an order of over £200,000 from South Africa for earth-moving equipment, the order being for 33 heavy-duty motor-graders, which bear the trade name "Wakefield," and are to be used by the Transvaal provincial administration. The order has been secured despite keen competition, particularly from America.

IN THE 12 MONTHS since the "Export Express Service" was introduced, British Railways has carried over 10,000 wagon-loads of shipment traffic from industrial centres to the London Docks. During that time there has not been a single case where a consignment has missed a boat due to a failure of the service. The service gives an assured next-morning arrival at the Royal, India, and Millwall group of docks for wagon-loads of export traffic despatched from 81 important centres on British Railways.

THE MAJORITY of the 1,000 workers at the Grantham engineering works of Ruston & Hornsby, Limited, went on a three- and four-day working week from Monday, November 11. It is hoped to resume normal working hours as soon as possible. The flow of orders has slowed down because of political unrest in the Middle East which imports extensively the small horizontal and vertical diesel engines and gears produced in the Grantham works. The Lincoln works of the firm are not at present affected by the Grantham decision.

A PROTEST by the Butterley Company, Limited, backed by Ripley Urban Council, has resulted in North Ward, Ripley, being renamed Butterley Ward. The change was approved at the Derbyshire County Council meeting on November 6. The Parliamentary Committee of the Council had stated that the company and Urban Council had made the reasonable and well-founded point that Butterley was a village in the proposed North Ward before the Butterley Company came into existence and, that in any event, the company had been associated with the area since 1790.

IN AN EFFORT to recapture lost markets in the Middle East, the Brush Group, Limited, is launching an export drive. Executives of companies in the group are going to Beirut, where a conference will be held attended by 58 agents from 17 countries in the area. The UK party will be led by Mr. Ian Morrow, managing director of the group, and Mr. Michael Clear, the export director. The Middle East has been chosen for the conference because it has been a good customer in the past and the group is anxious to regain the business lost as a result of the Suez crisis.

A MEMBER of the Platt Bros. & Company (Holdings), Limited, group, Hayward Tyler & Company, Limited, Luton (Beds), is to manufacture the three 70 h.p. main coolant pumps for the Danish reactor DR 3 at Riso. The order was awarded to the group by Head Wrightson Processes, Limited, which is supplying the reactor to Denmark. Hayward Tyler has entered into a licensing agreement with A/B de Lavals Angturbin, of Sweden, for the manufacture of vertical and horizontal steam turbines primarily for use as drivers of centrifugal cargo and ballast pumps.

ALMOST CERTAIN to be the highest installation of its type in the world, a Birlec arc melting furnace was recently taken aboard the S.S. Sarmiento destined for Bolivia. Consigned to corporation Minera de Bolivia of Catavi, Bolivia (an enterprise owned by the Bolivian Government), the furnace is of 3 tons capacity with a rating of 1,500 kva and is to be built 12,280 ft. above sea level. To the opposite extreme Birlec, Limited, announce that they have received an order for what will be one of the lowest furnace installations in the world —a smaller arc melting furnace of 1½ tons capacity to be built in Galcuk, Turkey.

BRIGHTSIDE ENGINEERING HOLDINGS, LIMITED, report that orders received by the Brightside Foundry and Engineering Company, Limited, for rolling mill plant are a record and include important export contracts for a French steelworks, a semi-continuous bar and rod mill for India, and a blooming mill for the Indian "ISCON" project. The ingot-mould foundry at the Ecclesfield Works has proved inadequate for some time to deal with an increasing demand, and work has started on the construction of the buildings for a new ingot-mould factory. Extra capacity for the production of general castings will become available in the existing foundry buildings.

BECAUSE he disliked asking for time off to attend the fortnightly meetings which are held in the afternoons, Councillor George Evans, of Bilston, a foundry worker, has resigned his seat on the South-West Staffordshire Divisional Education Executive. Councillor Evans says that some time ago he asked if the meetings could be held in the evenings, but the majority were in favour of continuing with the afternoon meetings, so he felt the best thing to do was to resign. Foundry work is not like office work, as one could not go off and leave it and catch up later. His employers had been very generous; they had never objected when he had asked for time off for Council meetings, but he felt somewhat uncomfortable about these demands.

THE KILMARNOCK ENGINEERING FIRM of Barr, Thomson & Company, Limited, celebrated their diamond jubilee at a dinner/dance given by the chairman and directors for 400 employees and friends, shareholders and business associates recently. Mr. Arthur C. Strathie, chairman of the company, announced that a non-contributory life assurance and retirement benefit scheme for works personnel would be instituted from December 1, as part of the diamond jubilee benefits. Each employee has received a jubilee bonus. The new pension scheme will provide a sum for the benefit of the family of an employee who may die before the age of 65 or a lump sum retirement benefit on retirement at 65 years of age. The complete cost of this is being met by the company.

ON OCTOBER 21, the laboratory of the development and research department of the Mond Nickel Company, Limited, celebrated its 21st anniversary. The laboratory, which is situated in Birmingham, was opened in 1936 by Lord Weir. At that time it had a staff of 16, under direction of Dr. L. B. Pfeil, O.B.E., F.R.S., and was the most modern of its kind in Europe. To-day, the staff numbers over 180 people. In the past 21 years, the laboratory has been responsible for the development of many new and valuable alloys, particularly the Nimonic series of high-temperature materials, and has also played an important part in the development of spheroidal-graphite cast iron. To celebrate its anniversary a dance was held at the Grand Hotel. During the evening, the present superintendent of the laboratory, Dr. W. Steven, presented a silver cigarette box to the original superintendent of the laboratory, Dr. L. B. Pfeil, who is now a director of the company.

Pig-iron and Steel Production

Statistical Summary of August Returns

The following particulars of pig-iron and steel produced in Great Britain are from statistics issued by the British Iron and Steel Federation. Table I summarizes activities during recent months. Table II gives production of steel ingots and castings in August and Table III, weekly average production of finished steel. Table IV gives the production of pig-iron and ferro-alloys in August, and furnaces in blast. (All figures are weekly averages in thousands of tons.)

TABLE I.—*Iron and Steel Price Index and General Summary of Pig-iron and Steel Production.*

Period.	B.o.T. Price Index, 1938 = 100.			Iron-ore output.	Imptd. ore used.	Coke to blast-furnaces.	Pig-iron, ferro-alloys prod.	Scrap used in steel prod.	Steel (incl. alloy).			
	I. & S.	Coal.	Basic materials excl. fuel[1]						Imports.[2]	Prod. ingots, castings.	Delivrs., finished steel.	Stocks.[3]
1955	276	399	529	311	244	246	240	213	29	381	305	1,247
1956	295	454	542	312	272	264	253	216	27	397	318	1,444
1957—May[4]	318	465	554	341	310	272	284	234	13	443	340	1,438
June ..	317	466	540	322	302	274	275	222	14	419	317	1,483
July[4]	320	500	537	316	292	264	263	190	17	362	273	1,579
Aug. ..	341	502	535	299	313	267	272	190	13	373	—	1,653

TABLE II.—*Weekly Average Production of Steel Ingots and Castings in August*, 1957

District.	Open-hearth.		Bessemer.	Electric.	All other.	Total.		Ingots and castings.
	Acid.	Basic.				Ingots.	Castings.	
Derby, Leics., Notts., Northants and Essex ..	—	4.9	13.2 (basic)	2.1	0.1	19.2	1.1	20.3
Lancs. (excl. N.W. Coast), Denbigh, Flints. and Cheshire	1.0	33.3	—	1.7	0.4	35.2	1.2	36.4
Yorkshire (excl. N.E. Coast and Sheffield) ..								
Lincolnshire	—	44.2	—	—	0.1	44.2	0.1	44.3
North-East Coast	0.6	74.5	—	1.1	0.3	75.0	1.5	76.5
Scotland	2.6	47.5	—	2.6	0.3	50.6	2.4	53.0
Staffs., Shrops., Worcs. and Warwick	—	17.0	—	1.0	0.6	17.2	1.4	18.6
S. Wales and Monmouthshire	3.2	73.6	7.0 (basic)	0.7	0.1	84.1	0.5	84.6
Sheffield (incl. small quantity in Manchester) ..	6.1	18.6	—	9.1	0.3	32.6	1.5	34.1
North-West Coast	—	1.4	3.7 (acid)	0.4	0.1	5.5	0.1	5.6
Tota	13.5	315.0	23.9	18.7	2.3	363.6	9.8	373.4
July, 1957[4]	15.4	300.5	24.3	20.0	2.3	352.7	9.8	362.5
August, 1956[4]	13.2	283.8	25.4	16.2	2.0	332.1	8.5	340.6

TABLE III.—*Production of New Non-alloy and Alloy Finished Steel.*

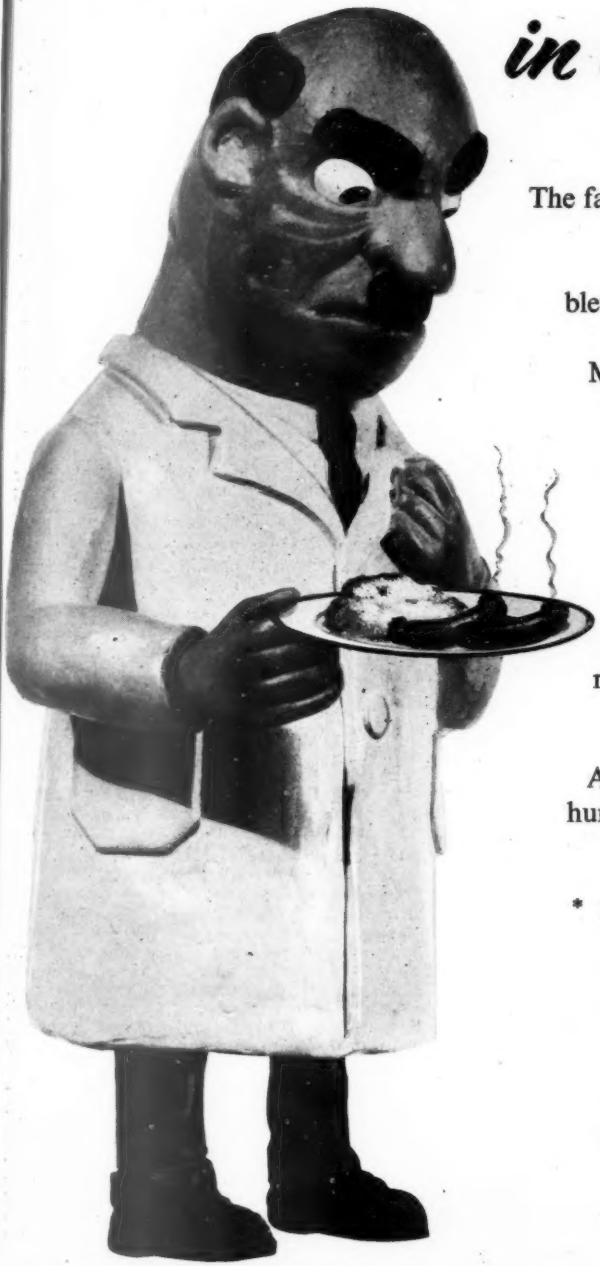
Product.	1955.	1956.	1956.	1957.	
			July.	June.	July.[4]
Non-alloy steel:					
Ingots, blooms, billets and slabs[5]	4.9	4.7	4.5	4.7	3.8
Heavy rails ..	9.4	9.7	6.5	11.4	10.1
Sleepers, etc. ..	2.0	1.8	1.4	1.6	1.6
Plates, 3mm. and over	46.1	50.2	36.1	52.4	41.9
Other heavy prod.	47.8	50.3	40.1	54.4	40.8
Ferro-con. bars, etc.	7.0	7.8	7.7	9.4	8.0
Wire rods	22.2	22.9	16.0	23.2	16.1
Arches, etc. ..	9.6	10.1	9.3	11.7	7.8
Other light sections	36.8	41.4	39.2	37.1	31.5
Bright steel bars ..	7.8	8.0	8.0	7.0	6.5
Hot-rolled strip ..	24.1	24.5	24.0	21.4	20.7
Cold-rolled strip ..	8.1	7.5	7.5	6.6	6.4
Sheets, incl. coated					
(i) Hot rolled ..	16.6	15.0	13.3	11.9	11.9
(ii) Cold reduced	26.1	24.8	19.3	29.1	26.9
Tin and terneplate	15.6	15.9	15.3	18.8	20.1
Blackplate ..	1.4	1.3	1.1	0.8	1.0
Steel tubes, pipes	22.9	26.2	26.5	25.5	23.7
Tube, pipe fittings	0.4	0.5	0.5	0.5	0.4
Tyres, wheels, axles	4.8	4.6	4.5	5.1	4.8
Forgings (excl. drop forgings) ..	2.5	3.0	3.0	3.4	2.7
Steel castings ..	4.2	4.5	4.2	5.1	3.9
Tool and magnet steel	0.3	0.3	0.3	0.4	0.3
Total	320.6	335.0	288.3	341.5	290.9
Alloy steel	15.8	17.3	17.5	17.4	15.9
Total deliveries from U.K. prod.[6] ..	336.4	352.3	305.8	358.9	306.8
Add: Imported finished steel ..	18.9	19.5	19.9	7.5	9.0
	355.3	371.8	325.7	366.4	315.8
Deduct: Intra-industry conversion[7] ..	50.9	55.2	51.2	50.2	44.2
Total new material ..	304.4	316.6	274.5	316.2	271 6

TABLE IV.—*Production of Pig-iron and Ferro-alloys during August*, 1957

District.	Furnaces in blast.	Hematite.	Basic.	Foundry.	Forge.	Ferro-alloys.	Total.
Derby, Leics., Notts., Northants and Essex	25	—	29.1	18.0	0.7	—	47.8
Lancs. (excl. N.W. Coast), Denbigh, Flints. and Cheshire ..	6	—	20.7	—	—	0.9	21.6
Yorkshire (incl. N.E. Coast and Sheffield) ..	—	—	—	—	—	—	—
Lincolnshire ..	10	—	37.6	—	—	—	37.6
North-East Coast	20	4.5	54.0	—	—	1.0	59.5
Scotland	10	0.8	19.5	1.7	—	—	22.0
Staffs., Shrops., Worcs., and Warwick ..	7	—	10.5	1.5	—	—	12.0
S. Wales and Monmouthshire	11	4.5	45.9	—	—	—	50.4
Sheffield	1	—	1.9	—	—	—	1.9
North-West Coast	9	17.9	—	0.2	—	1.6	19:7
Total ..	99	27.7	219.2	21.4	0.7	3.5	272.5
July, 1957[4] ..	98	28.4	208.5	22.9	0.4	3.2	263.4
August, 1956[4] ..	100	23.6	183.5	25.1	0.8	2.9	235.9

[1] Used in non-food-manufacturing industry.
[2] Weekly average of calendar month.
[3] Stocks, mainly ingots and semi-finished, at the end of the years and months shown.
[4] Five weeks, all tables.
[5] Other than for conversion into any other form of finished steel listed.
[6] Includes finished steel produced in the U.K. from imported ingots and semi-finished steel.
[7] Material for conversion into other products also listed in this table.

The Biggest Binder in the Business



The fat was in the fire the other lunch-time. Just as our Oldest Hand arrived, a great cloud of smoke blew out of the serving hatch. Fond though he is of our Canteen Manageress, the Old Boy couldn't resist the observation:

"You'd get much less obnoxious fumes if you used our Sternocore binders* in those bangers, love!"

"That," she said, "is a bright remark—coming from the biggest binder in the works!"

At which our Oldest Hand retired hurt, to brood over his two charred sausages and mash.

* *They would impress you with their higher permeability and lower true cost.*

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Personal

Mr. A. L. KITCHEN has resigned as a director of Kitchen & Wade, Limited.

Mr. P. W. MCKENZIE has been appointed a director of Midland Industries, Limited.

Mr. E. DAYBELL announces a change of residence to "Elmside," 96, Hawthorn Close, Hitchin.

Dr. J. P. CHILTON, of Clare College, has been appointed a demonstrator in the Department of Metallurgy at Cambridge University for three years.

Mr. S. WATTS, a departmental manager with C. & J. Hampton, Limited, toolmakers, Sheffield, has retired after 50 years with the firm. He was recently awarded the M.B.E. for his work and service to sport.

Following his recent retirement as engineer-in-chief of the Fleet, Vice-Admiral Sir FRANK MASON has accepted a position as consultant to the management of the Metropolitan-Vickers Electrical Company, Limited.

Mr. H. DARNELL has been appointed chief engineer of Workington Iron and Steel Company, a branch of the United Steel Companies, Limited. He succeeds Mr. G. F. Strang, who has left the company to take up another appointment.

Mr. GEORGE C. WELLS has been appointed president of Union Carbide International Company, division of Union Carbide Corporation. He succeeds Mr. A. MACKENZIE, who reaches normal retirement age this winter after more than 40 years with the Corporation.

Mr. H. SUTTON, works controller at the Trafford Park Works of Lancashire Dynamo & Crypto, Limited, retired on October 31. To mark this occasion, a presentation was made on behalf of his colleagues by Mr. A. W. A. DICK-CLELAND, joint managing director of the company.

Mr. T. C. FAWCETT, manager of the northern sales region of Imperial Chemical Industries, Limited, has retired after more than 34 years' service with the company and its predecessors. Mr. G. W. INNES, personnel director of the company's alkali division, succeeds Mr. Fawcett as northern regional manager.

Sir ALEXANDER TODD, Professor of Organic Chemistry at Cambridge University and chairman of the Advisory Council on Scientific Policy, has been awarded the 1957 Nobel prize for chemistry. The award, which amounts to about £14,400, is for his work on nucleotides and nucleotide enzymes.

Senator THEODORE F. GREEN, chairman of the Foreign Relations Committee of the United States Senate, visited the High Authority of the European Coal and Steel Community on November 7. Senator Green, who is touring NATO capitals and will report to the Foreign Relations Committee on his return, was received by Mr. MAX KOHNSTAMM, Special Adviser to the High Authority.

The *S. & W. Magazine*, issued by Smith & Wellstood, Limited, of Bonnybridge, reports the retirement of Mr. ROBERT STIRLING, who joined the firm in 1902, and since the 1914 war has been in charge of the apprentice moulders. He served with the Gordon Highlanders during the first world war, and in the advance of Cambrai he was wounded and as a result lost his left hand.

Mr. A. G. GRANT, managing director of Whessoe, Limited, Darlington, and chairman of the British Industries Council Education Committee, presented long-service awards to staff and employees of Robert Jenkins and Company, Limited, engineers, Wortley Road, Rotherham on November 4. Mr. J. W. ELSTONE received an award for 35 years' service, and among those with 25 years' service was Mr. W. ALLEN JENKINS, a director of the firm. Mr. A. R. JENKINS, managing director, told the apprentices that they would have to help meet the challenge of increasing competition from Europe. He would not say there was going to be a trade recession but a number of people had told him their order books were getting shorter.

Obituary

JAMES K. SHANKS

Mr. James J. Shanks, M.B.E., D.L., J.P., who had been associated for 60 years with Cruikshank & Company, Limited, Denny Iron Works, Denny, including 30 years as managing director and the last eight years as chairman, died on November 3 at the age of 88.

One of the old school of engineers, he took his original training on Clydeside, and after being at sea for some years he returned to develop many marine and engineering projects. He became a member of the Institute of Engineers and Shipbuilders in Scotland in 1901 and a life member of the West of Scotland Association of Foremen Engineers and Draughtsmen in 1908. By the time he joined the Institute of Patentees in 1925 he claimed to have made application for over 40 patents, including protection for dairy equipment and abrasion-resistant alloys.

He made the firm one of the original members of the Cast Iron Research Association, and was for many years chairman of the Foundry Committee of Scottish Engineering Employers' Association and the Scottish Ironfounders' Association, and a prominent member of the Scottish Steel Founders' Association.

In civil affairs he took a very active part in the development of the Burgh of Denny and acted as Provost from 1926-1932.

Mr. WILLIAM YUILLE, of Wm. C. Yuille & Company, Limited, engineers, founders, and shipbuilders' furnishers, etc., of Glasgow, died recently.

The death is announced of Mr. W. R. PURNELL, O.B.E., chairman of New Conveyor Company, Limited, one of the Tube Investments group of companies.

The death is announced of Mr. G. W. BUSH, who, until his retirement from that position in 1954, was a director of Renshaw Foundry, Limited, Staines. He was a member of the Institute of British Foundrymen, which he joined in 1942.

Mr. JOHN SPITTAL, who has died at the age of 73, was a former director of finance and accounting of G. & J. Weir, Limited, engineers, Cathcart, Glasgow. He joined the firm in 1920 as cost accountant at their Argus Foundry, Thornliebank, and was later appointed to the board of directors, on which he served for many years. He retired in 1955.

Mr. E. C. DUNKERTON, a director of Robey & Company, Limited, Lincoln, died suddenly last week. Mr. Dunkerton, who commenced his apprenticeship with the firm in 1888, was appointed a director in 1923, and rendered 69 years' valuable service. He was a member of the Institution of Mechanical Engineers, a founder member and early president of the British Compressed Air Society, one of the first presidents of the Lincoln Engineering Society, and for 32 years was on the Council of the Lincoln Chamber of Commerce.

CONSTANT SPEED GRINDING:

For maximum efficiency, grinding wheels must work at a definite, maintained speed. That is why Hicycle grinders are used more and more for this heavy production job, because their constant speed at all loads enables operators to remove measurably more metal in a shorter time, for less wheel wear. Size for size Hicycle grinders have greater power reserve which also contributes to a greater rate of production. Write for the Hicycle catalogue.

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Raw Material Markets

Iron and Steel

Outputs of pig-iron are well maintained, and with the tonnages now being produced it is expected that the yearly total will be nearer 14,500,000 tons than the 14,000,000 tons originally aimed for. This has been accomplished by the bringing in of new and larger furnaces and from the increased capacity of reconstructed units. Most of the increased supplies have been in the basic steelmaking grade. The steelworks have thus had sufficient to overcome any shortages which existed in the past, and have had to rely much less on additional tonnages from overseas. Appreciable tonnages are being placed into stock and imports are likely to continue to dwindle. In fact, home sources could supply increased quantities if required.

Outputs of most grades of foundry irons exceed demands, and only in the low-phosphorus irons do demands approximate to supply. The engineering and speciality foundries are able to absorb most of this grade and in some brands and analyses larger quantities than are at present being received are called for. The foundries supplying castings to the motor vehicle trade fully expect that present demands at least will continue for some time ahead. Hematite pig-iron, which is also being taken up by them, is in good supply, as are refined irons, which they utilize to a lesser extent.

High-phosphorus pig-irons are plentiful, and present demands from the light, jobbing, textile, and some of the engineering foundries are not absorbing anywhere near the tonnages produced. Outputs of this grade have for some time been on a reduced scale as some furnaces previously making high-phosphorus irons were changed over to basic steelmaking grades to meet the then more pressing needs of the steelworks. This position has now been overcome, and it is learnt that a large furnace in the Derbyshire area has reverted to the manufacture of high-phosphorus pig-iron, supplies of which will thus be increased. It is hoped that demands will improve, although the prospects are none too bright. Consignments of high-phosphorus pig-iron are being shipped abroad, so helping makers to reduce stocks. All other grades are also available for export, and orders are being obtained against strong competition from overseas producers.

Home steelworks have no difficulty in satisfying present demands for steel semis, and much larger tonnages could be supplied if required. Many of the re-rollers, however, have sufficient material in stock to meet their present reduced needs, particularly in the smaller-sized billets of 2¼ in. to 3 in. square. In view of the plentiful supplies of steel billets available from home sources, it is understood that imports will be kept at the lowest level possible.

Non-ferrous Metals

What happened last week in the copper markets in London and in New York did nothing to settle the argument of whether the recent activity in the markets presages a steady rise in the copper quotation or only indicates that the downward trend in the price has been halted. Admittedly, the surprise action of the US custom smelters in raising their price ½ cent to 26 cents a pound looks like being held, but there has been no real revival of buying interest on either side of the Atlantic. Nevertheless, the fact that the price could be raised—and the Belgian quotation was also increased last week to the equivalent of 23.80 cents a pound New York—does reflect a better consumer interest than formerly.

Figures released towards the end of last week showing that copper stocks continue to rise was a bearish influence on the market as was the fact that Wall Street was virtually indifferent to President Eisenhower's latest speech. However, the statistics relating to US copper does show that stocks in the hands of consumers is not large and that being so there is something to be said for the argument that if trouble breaks out in any of the major producing areas, a large quantity of copper would have to be found to meet the demand, which would quickly be reflected in the price. Meanwhile, the present price in London has stopped the shipment of copper to the USA. Continental inquiry is slightly better, but overall demand is still not good. In the US producers are still quoting 27 cents, copper for export is higher at 25½ cents, and scrap is being offered at 20½ cents a pound.

Tin is quietly steady on both sides of the Atlantic, although the cash price in London is still being supported by the buffer stock manager at £730 a ton. The backwardation has now widened to around £15 a ton. Whether the task of supporting the cash price at £730 a ton is proving more onerous than orginally expected is not known. But if so the next move would be for the buffer stock manager to make further calls on the producing countries sooner than originally intended. In the US the price is fractionally below 90 cents.

Lead is a fairly steady market on both sides of the Atlantic. Figures now released show that US consumption of lead in August was 100,600 tons, which was the highest of any month in 1957 and over 20 per cent. higher than consumption in July. Otherwise demand remains of a routine nature. In the US the price is steady at 13½ cents a pound.

Zinc is featureless, with plenty of metal about to meet the slightly better all round demand for the metal. Buying of special high-grade metal continues well both in London and in New York from the automobile industries. The chief news is still that concerned with the disposal of 9,000 tons of zinc from the Board of Trade stockpile during the months of December, January, and February. In the US the price remains at 10 cents a pound for "Prime Western," East St. Louis.

Contracts Open

The dates given are the latest on which tenders will be accepted. The addresses are those from which forms of tender may be obtained. Details of tenders with the reference ESB can be obtained from the Board of Trade Export Services Branch, Lacon House, Theobalds Road, London, W.C.1 (telephone: CHAncery 4411, ext. 738 or 771), unless otherwise stated.

BROMYARD. November 29—Laying approximately 1,000 yd. of 6- and 3-in. dia. cast-iron pipe water mains at Bishop's Frome, near Bromyard, for Rural District Council. Apply in writing to the consulting engineers, Richards and Dumbleton, Cornwall Buildings, 45, Newhall Street, Birmingham, 3. Deposit £2, payable to Council.

NORTHANTS. November 25—Laying of approximately 4,800 lin. yd. of 6-in. dia. spun-iron pipe from Naseby to Sibbertoft, and approximately 3,300 lin. yd. of 4-in. dia. and 780 lin. yd. of 3-in. dia. spun-iron pipe from Yelvertoft to Elkington. Contract No. 415, for the Mid-Northamptonshire Water Board. Documents from L. H. Brown, chartered civil engineer, Cliftonville, Northampton. Deposit £2 2s.

PLYMPTON ST. MARY, DEVON. November 25—Laying and supplying of pipes for approximately 303 yd. of 9-in. dia. and approximately 205 yd. of 6-in. dia. spun-iron water main, together with ancillary works and fittings, at Goosewell, Plymstock, for Rural District Council. Documents from the Engineer and Surveyor, Council Offices, Plymbridge Road, Plympton. Deposit £2 2s.

WEST KESTEVEN. November 29—Laying of spun-iron pipe water mains and construction of small pumping station at Bassingthorpe, etc., for Rural District Council. Deposit £5 5s. Documents from Elliott and Brown, Stanley House, Pelham Road, Nottingham; tenders to J. R. Morgan, Clerk of the Council, 19, Watergate, Grantham, Lincs.

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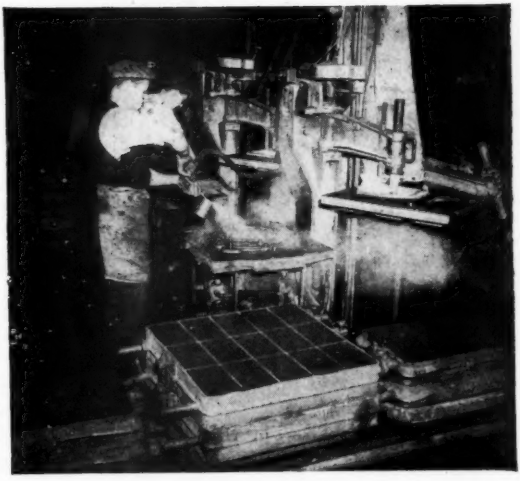

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MONTREAL, TORONTO & VANCOUVER

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

November 13, 1957

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2:—Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £23 17s. 0d., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent. P, up to 3 per cent. Si), d/d within 60 miles of Stafford, £24 1s. 3d.

Scotch Iron.—No. 3 foundry, £25 3s. 6d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 19s. 0d.; South Zone, £26 1s. 6d.

Refined Malleable.—P, 0.10 per cent. max.—North Zone, £27 6s. 6d.; South Zone, £27 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent.:—N.-E. of England (local iron), £25 6s. 6d.; Scotland (Scotch iron), Zone S. 1, £25 13s. 0d.; Sheffield, £26 15s. 0d.; Birmingham, £27 4s. 0d.; Wales (Welsh iron), £25 6s. 6d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leics.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £50 0s. 0d. to £52 15s. 0d., scale 17s. 0d. to 17s. 6d. per unit; 75 per cent. Si, £70 0s. 0d. to £76 7s. 6d., scale 17s. 0d. to 17s. 6d. per unit.

Ferro-vanadium.—50/60 per cent., 28s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 6d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £299 0s. 0d.

Ferro-tungsten.—80/85 per cent., 9s. 2d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 12s. 2d. per lb. of W.

Ferro-chrome (6-ton lots and over).—4/6 per cent. C, £96 0s. 0d. to £99 10s. 0d., basis 60 per cent. Cr, scale 33s. 0d. per unit; over 6 per cent. C, £94 0s. 0d., basis 60 per cent. Cr, scale 31s. 0d. to 33s. 0d. per unit; 2 per cent. C,* 2s. 2d. per lb. Cr.; 1 per cent. C,* 2s. 2½d. per lb. Cr; 0.15 per cent. C,* 2s. 3d. to 2s. 3½d. per lb. Cr; 0.10 per cent. C,* 2s. 3½d. to 2s. 3¾d. per lb. Cr; 0.06 per cent. C,* 2s. 3¾d. to 2s. 4d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 7s. 3d. to 7s. 10½d. per lb.

Metallic Manganese.—90/92 per cent., carbon-free, £290 0s. 0d.; 96/98 per cent., £310 0s. 0d.

Ferro-columbium.—65/75 per cent., Nb + Ta, 22s. 0d. to 23s. 0d. per lb., Nb + Ta.

Ferro-manganese (home).—78 per cent., £87 19s. 3d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft, u.t., £33 1s. 6d.; tested, 0.08 to 0.33 per cent. C, £34 1s. 6d.; hard (0.41 to 0.60 per cent. C), £35 3s. 0d.; silico-manganese, £44 2s. 6d.; free-cutting, £37 5s. 6d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £41 7s. 0d.; silico-manganese, £44 10s. 0d.

* Average 68-70 per cent.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.33 per cent. C, £38 16s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £39 18s. 6d.; acid, up to 0.25 per cent. C, £43 10s. 0d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £42 12s. 0d.; boiler plates (N.-E. Coast), £45 2s. 0d.; floor plates (N.-E. Coast), £44 1s. 0d.; angles, N.-E. Coast, £40 6s. 6d.; joists, N.-E. Coast, £40 2s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats, 5 in. wide and under, untested soft basic, 50 tons and over, £40 8s. 0d. (under 10 tons to 4 tons, £41 5s. 6d.; under 4 tons to 2 tons, £41 10s. 6d.); hoop and strip, coils, £40 10s. 0d.; uncoated strip mill coils, hot rolled, under 3mm. to 12g., £45 16s. 0d.; black sheets (hand mill), 24 g., 59 4s. 6d.; galvanized corrugated sheets, 24 g., £68 0s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £69 9s. 6d., nickel-chrome, £100 12s. 6d.; nickel-chrome-molybdenum, £112 16s. 6d.

NON-FERROUS METALS

Copper.—Cash, £190 10s. 0d. to £191 0s. 0d.; three months, £194 15s. 0d. to £195 0s. 0d.; settlement, £191 0s. 0d.

Copper Tubes, etc.—Solid-drawn tubes, 1s. 10½d. per lb.; rods, 217s. 6d. per cwt. basis; 20 s.w.g., 250s. 9d. per cwt.

Tin.—Cash, £730 0s. 0d. to £731 0s. 0d.; three months, £719 0s. 0d. to £720 0s. 0d.; settlement, £731 0s. 0d.

Lead (Refined Pig).—First half November, £84 10s. 0d. to £84 15s. 0d.; first half February, £84 5s. 0d. to £84 10s. 0d.

Zinc.—First half November, £68 0s. 0d. to £68 5s. 0d.; first half February, £67 5s. 0d. to £67 10s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations £102 15s. 0d.; rolled zinc (boiler plates), all English destinations, £100 10s. 0d.; zinc oxide (Red Seal), d/d buyers' premises, £88 10s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 6½d. per lb.; sheets to 10 w.g., 168s. 6d. per cwt.; wire, 2s. 4d.; rolled metal, 168s. 6d. per cwt.

Brass (Brazing).—BS1400, B3 (65/35), £138; B6 (85/15), — ; BS249, —.

Brass (High Tensile).—BS1400, HTB1 (30 tons), £181; HTB2 (38 tons), — ; HTB3 (48 tons), — .

Gunmetal.—BS1400, LG2 (85/5/5/5), £172; LG3 (86/7/5/2), £183; G1 (88/10/2/½), £239; (88/10/2/1), £228.

Phosphor Bronze.—BS1400, PB1 (AID released), £258 per ton.

Phosphor Bronze Strip, etc.—Strip, 242s. 9d. per cwt.; sheets to 10 w.g., — per cwt.; wire, 3s. 7¾d. per lb.; rods, 2s. 11d.; tubes, 2s. 11d.; chill cast bars: solids 2s. 10¾d., cored 2s. 11¾d. (CHARLES CLIFFORD, LIMITED.)

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 6d. per lb.; round wire, 10g. in coils (10 per cent.), 3s. 10¾d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 3s. 9¾d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 5½d. per lb. Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £72 10s. 0d. Nickel, £600 0s. 0d. Aluminium ingots, £197 0s. 0d.; aluminium bronze (BS1400), AB1, £218; AB2, — .